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Ground Investigation Report

Proposed floodlit artificial 3G pitches

East Bierley Sports Community Association

January 2023



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Proposed floodlit artificial 3G pitches

East Bierley Sports Community Association

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Executive Summary

Development proposals and site description

The proposed development is for the construction of a 11v11 3G LED floodlit Football Turf Pitch (FTP), along with a hybrid pitch, Multi-Sport training area and improvements to soft and hard landscaping, including parking provision.

Site history

The earliest available maps date back to the late 1800s and show the wider site comprised the Cross Pit coal and ironstone mine workings. A tramway and small reservoir associated to the mine workings are present on site at this time. Further mine workings are noted off-site beyond the north and west of the site. By the early 1900s all ancillary features of the coal pit are no longer shown. By circa. 1950s, the majority of the coal pit appears to have been backfilled and the area of the proposed FTP was recorded as a football ground with pavilion building to the northwest. Earthworks to the south of the football ground continue up until the late 1900s, at which point the site represents the present-day layout.

Ground conditions

Topsoil (0.12m to 0.35m in thickness) over Made Ground representing colliery spoil was encountered, the latter to depths between 0.4m and 5.4m, deepest to the south and southwest of the existing pitch. Natural ground comprised suspected Superficial Glacial Till (not recorded on BGS records) overlying deposits of Weathered Pennine Lower Coal Measures Formation.

Coal mining and ground stability

During the first phase of works, 4No. open hole boreholes were undertaken across the site to determine the presence of any shallow unrecorded (<30m bgl) coal workings. Coal seams were observed to the south and east of the existing pitch, at depths ranging from 8.2m to 13.8m, and thicknesses ranging from 0.2m to 1.2m. Coal was interpreted as being intact black coal and likely representative of the shallower Blocking Rider (all rotary positions) and deeper Blocking Coal Seams (RBH04 only).

Within RBH01 to the northwest of site, a void (part of a possible mine working) was encountered at a depth of 8.7m to 9.5m.

A further 6No. rotary boreholes were undertaken during a second phase of works to further investigate the extent of the voiding observed within RBH01. RBH104 and RBH105 also intersected this void in the north-west of the site.

If the roof of the workings collapsed, the resultant void could potentially migrate to surface. However, in light of the development and location of the pitches/pavilion as currently proposed, the risk of the development promoting collapse of identified mine workings is considered to be low.

Drainage and infiltration potential

Our infiltration testing indicated that the Glacial Till soils are not suitable for soakaway type systems. Alternative means of disposal will need to be sought.

Earthworks assessment and pitch foundations

Earthworks classification testing has undertaken and indicates that the Made Ground comprises a Class 1A or 1B General Granular Fill whereas the Devensian Till comprises a Class 2C Stony Cohesive Fill. In order to achieve 95% compaction, subject to a maximum 10% air voids, the acceptable moisture content range would be 12 – 18%. It is estimated that 60% of the in situ material would be unsuitable for re-use without some form of conditioning. Granular soils are considered suitable for reuse once mixed.

CBR design values of 5% for the Artificial Pitch, 8% for the Grass Hybrid Pitch and parking area, and >10% for the Multi-sport training area have been established as suitable across the site. Due to the variable composition/strength/density (the latter particularly evident in CBR test data) and thickness of Made Ground at the site, particularly in southern areas of the proposed FTP, we recommend that such soils present at and below formation levels are appropriately conditioned to achieve a more consistent level of compaction and minimise levels of total and differential settlement across the proposed pitches and car parking areas.

Floodlight foundations

In our opinion the naturally deposited clay soils of the Glacial Till will adequately support pad foundations for the proposed floodlight bases. A concrete class of DS-2 and ACEC-1s is required.

Deeper foundations will be required where Made Ground is present to greater depths, particularly to the west and southwest of site. A piled solution could be utilised in areas of deeper Made Ground Based on the current development layout.

Contamination and waste assessment

Elevated PAH concentrations were previously recorded in 2016 within the colliery spoil Made Ground and remedial measures proposed. Additional speciated PAH test suites have been carried out within Topsoil and Made Ground deposits across the site using Suitable for Use Levels (S4ULs) for Public Open Space (Park) as guideline values. Results indicate no significant exceedances of the guideline values which would give cause for concern, thus no remedial measures are considered necessary for development.

Crocidolite asbestos was detected within a composite sample of the Topsoil. Upon quantification of this, it is noted that the total asbestos found is negligible (0.001%). 12No. additional shallow Topsoil samples were retrieved from the site during the second phase of works with all results returning negative for asbestos. On this basis it is recommended that typical toolbox talks for asbestos are given to all site personnel during the development, along with adoption of appropriate PPE and good hygiene practices.

The previous designation of CS2 for the site is considered overly conservative given the carbon dioxide concentrations were only in excess of 5.0% on one visit in one borehole, with <5.0% on all other occasions. Given the flow rate is very low (0.3l/hr max), only one visit recorded carbon dioxide very marginally above 5.0% (5.3%), proposed end usage, low biodegradable content noted and the age of the colliery spoil, a site characterisation of CS1 is more applicable and therefore, in our opinion, no ground gas protection measures are considered necessary in new buildings.

Laboratory testing indicates that the Topsoil present on site is suitable for reuse within a public open space (park) setting. By virtue of elevated organic carbon content, the Topsoil would be suitable for disposal as non-hazardous waste within a non-hazardous landfill site.

The cohesive and granular colliery spoil Made Ground on site has been classified as hazardous due to the levels of total organic carbon. It is therefore recommended that colliery spoil deposits are used as far as possible for reuse within the redevelopment process in accordance with a Material Management Plan (MMP). If disposed offsite, some deposits may require pre-treatment, but this would be at the landfill operators discretion.

Recommendations for further works

No further investigation works are considered necessary.

1 Introduction

1.1 Project Brief

1.1.1 The proposed development is for the construction of a 11v11 3G LED floodlit Football Turf Pitch (FTP), along with a hybrid pitch, multi-sport training area, floodlighting and improvements to soft and hard landscaping, including parking provision. An existing site plan and proposed development plan is presented below in Figure 1-A. A plan is presented in the drawings section of this report also.

1.1.2 As the existing rugby pitch to the south of the site is not subject to addition of any infrastructure, and repositioning from current location is marginal. Therefore it is not considered further in this assessment.

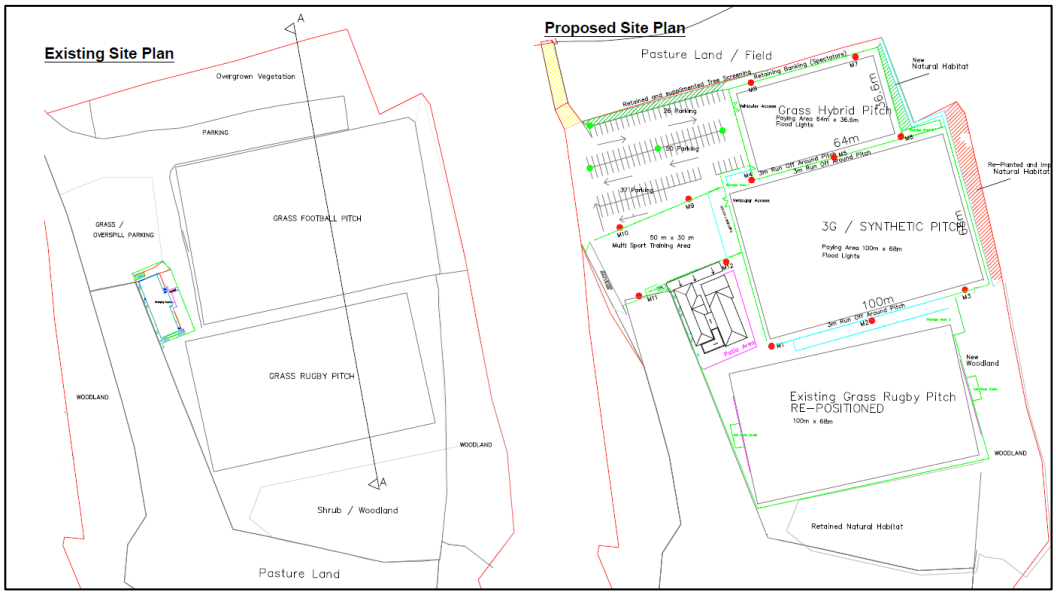


Figure 1-A: Current and Proposed Site Plan, extracted from drawing EBSCA_02_04G

1.1.3 A coal mining risk assessment report was previously produced for the site by Ashton Bennett in March 2014, a copy of which is presented in Appendix A. The report indicates a risk of ground instability could result due to the collapse of possible shallow coal mine workings and intrusive investigations were recommended to determine risks.

1.1.4 A previous ground investigation report has been completed in the vicinity of the proposed changing block extension to the north of the existing pavilion, undertaken by Rogers Geotechnical Services Ltd (RGS) in 2016. The works included comprised 3No. windowless sampler boreholes up to 4.0m deep and 3No. adjacent dynamic probes up to 6.1m deep. The investigation indicated the depths of Made Ground colliery spoil may be between 3.5m and greater than 4.0m depth in that area.

1.1.5 During the RGS 2016 investigation elevated concentrations of several polycyclic aromatic hydrocarbons (PAHs) were recorded within colliery spoil material in WS3 at 0.4m depth. Therefore, remedial measures including a 5.0m x 5.0m concrete barrier layer at this location were proposed to address the risks posed by such contamination. Additionally, a maximum ground gas concentration of 5.3% carbon dioxide was recorded on one occasion during post-fieldwork gas monitoring, and a Characteristic Situation 2 was designated to the site. As a result, ground gas protection measures were recommended in the new building.

1.1.6 The scope of works for the Soiltechnics 2022 investigation has been completed in accordance with the framework agreement for a ground investigation utilising windowless sampling methods with the addition of rotary open-hole boreholes to confirm the onsite coal mining risk to the development. The principal objectives of the ground investigation are to establish ground conditions at the site to assess the infiltration potential and provide design parameters for the artificial sports pitches, floodlight foundations and hardstanding/car parking provisions. The report will also advise on abnormal ground conditions, coal mining risk, provide further analysis and assessment of previously identified contamination (PAHs and landfill gases) and provide recommendations for further investigation works where applicable.

1.1.7 As part of this Revision B report update, we have undertaken additional intrusive coal mining investigations, further works to determine the prevalence of asbestos previously identified in Topsoil deposits, and completion of an earthworks classification and re-use assessment for site won soils.

1.1.8 The report is considered sufficient to address planning conditions 11 & 12 (coal mining) and 13-15 (contamination) for the proposed development under planning application 2021/62/90357/E.

1.1.9 In addition to the above, an electrical survey was commissioned for the project, provided under separate cover.

1.2 Site Location and Description

1.2.1 The site is located to the north of East Bierley Sports Community Association at the following postal address:

Land Off Hunsworth Lane
East Bierley
Bradford
BD4 6PU

1.2.2 The proposed new pitches are located at East Bierley Playing Fields, situated in the suburban area of East Bierley, approximately 6km to the southeast of Bradford city centre. Hunsworth Lane provides access from the north-western corner of the site.

1.2.3 The proposed FTP pitch is situated over the existing grassed football pitch, whilst the hybrid pitch proposal to the north comprises a gravelled parking area, alongside mature vegetation within the northern most section of the site. The wider site encompasses an existing natural turf rugby pitch to the south, with open and vegetated land beyond. Site boundaries are delineated by mature woodland to the east, south and west.

1.2.4 Based on existing topographical data, surface levels fall ~4m from north to south across the proposed hybrid pitch area, and a further 3m from north to south across the proposed FTP development area. Levels fall by a further 10m from the southern edge of the proposed FTP to the southern boundary of the wider site. Small streams / becks are noted along the southern and eastern boundary of the wider site.

1.2.5 We understand that the existing pavilion on site (west of proposed FTP) will be extended and that previous ground investigation works have been completed in this area as outlined in paragraph 1.1.4. It is understood that no further works are required to support the foundation design of the pavilion, but the Coal Mining Risk Assessment included in Section 5 of this report will consider mine workings beneath the proposed pavilion extension footprint.

1.2.6 A selection of photographs taken on site are presented below.



Figure 1-B: From northwest of site looking south towards existing pitch and pavilion



Figure 1-C: From south of site looking east towards the existing pitch



Figure 1-D: From east of site looking southwest towards the existing football and rugby pitches

2 Desk Study

2.1 Site History

2.1.1 An attempt to trace the history of the site has been carried out by reviewing readily available Ordnance Survey maps, including those presented in the Desk Study report for the site produced by RGS in 2016. The earliest available maps date back to the late 1800s and show the wider site comprised the Cross Pit (coal and ironstone mine workings) to the south with two coal shafts and one air shaft recorded (not within area of proposed pitches). A tramway runs from the pit and offsite to the west. A small reservoir associated to the coal pit is recorded within the eastern centre of the wider site. Further mine workings are noted off-site to the north and west of the site.

2.1.2 By the early to mid-1900s all ancillary features of the coal pit are no longer shown within the historic maps and the two coal shafts are now referenced as 'old'.

2.1.3 By circa. 1950s, the majority of Cross Pit appears to have been backfilled and the area of the proposed FTP now contains a football ground with pavilion building to the northwest. Earthworks to the south of the football ground continue up until the late 1900s, at which point the site represents the present-day layout. Refer to Figure 2-A and 2-B below.

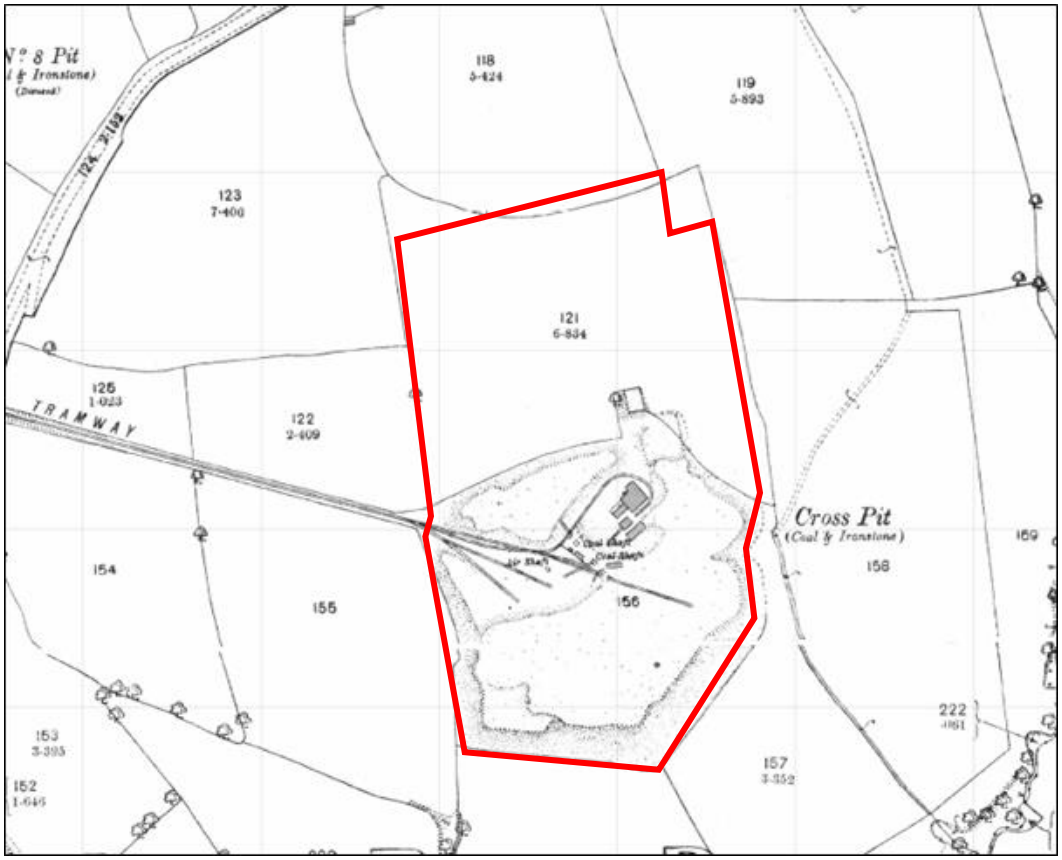


Figure 2-A: 1893 Historical map extract (wider site boundary in red)

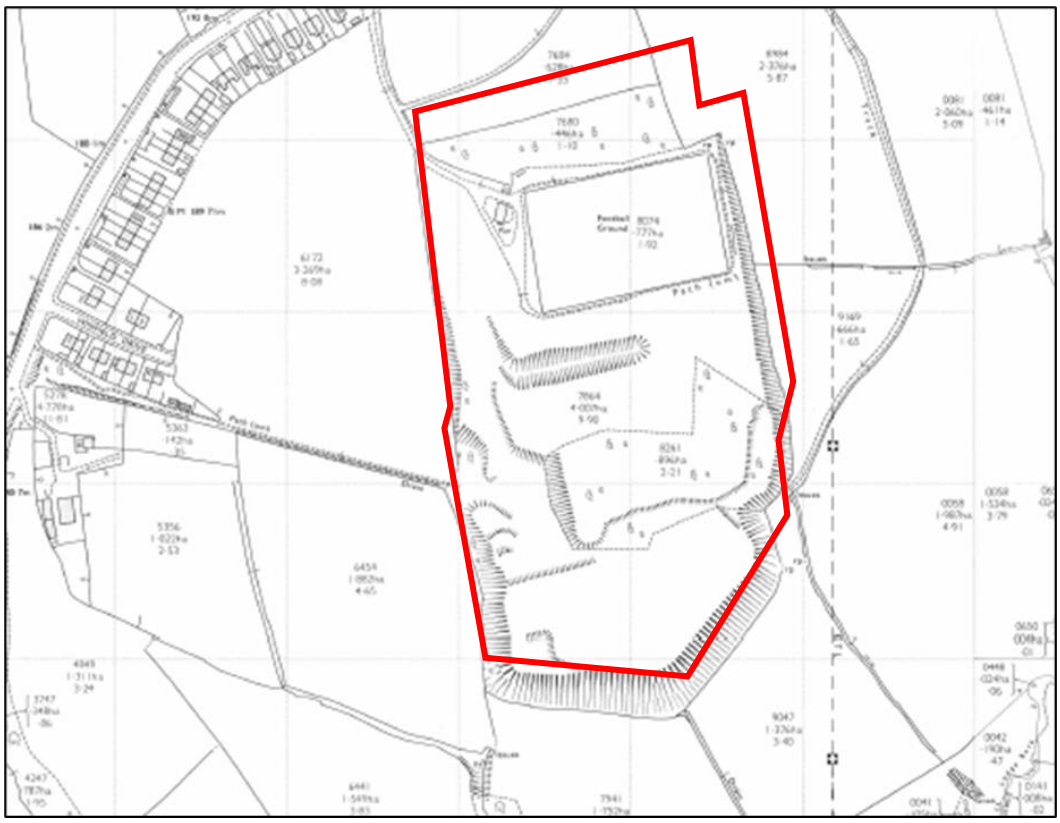


Figure 2-B: 1971-75 Historical map extract

2.2 Geology and Hydrogeology

2.2.1 The BGS records artificial ground to be present, encompassing nearly all of the wider site and FTP/hybrid pitch.

2.2.2 Open-source British Geological Survey (BGS) mapping for the area shows there to be no superficial deposits in the area.

2.2.3 The underlying bedrock at the site is recorded as the Pennine Middle (south of site) and Lower Coal Measures Formation (north of site), comprising of interbedded sandstone, mudstone and siltstone with coal seams.

2.2.4 A summary of the anticipated geology within the proposed pitch development is presented below.



Figure 2-C: Artificial deposits (proposed hybrid pitch outline in green, proposed FTP in blue)



Figure 2-D: Bedrock geology

2.2.5 Table 1 below summarises anticipated geological conditions on site:

Strata	Type	Approximate thickness	Typical soil type	Likely permeability
Topsoil	-	~0.20m	Organic soil	-
Made Ground	Artificial	Variable, up to 4.2m deep in the west of site.	Colliery Spoil	Variable
Pennine Coal Measures (Middle and Lower)	Bedrock	Basal Unit	Mudstone, Siltstone and Sandstone with coals	Low to Moderate

Table 1: Summary of anticipated geology and hydrogeology

2.3 Mining and Ground Stability

2.3.1 Coal Authority Mapping shows the site lies within a Coal Mining Reporting Area, with the southern half of the proposed pitch recorded within a development high risk area associated with probable shallow coal mine workings (see Figure 2-E).

2.3.2 A detailed coal mining risk assessment has already been commissioned for part of the wider site, associated with the redevelopment of the existing pavilion building, completed by Ashton Bennett in March 2014 (Report Ref: KC 3147). A copy of the report is presented within Appendix A.

2.3.3 The report concludes there is a low risk of land instability occurring associated with collapse of recorded deep coal workings in excess of 30m depth. However, there remains a medium to high risk of land instability occurring associated with collapse of unrecorded shallow coal mine workings (Blocking Rider Coal and Blocking Coal seams), which may be present beneath the site (<30m depth). Such features could also impact the wider site (red line boundary).

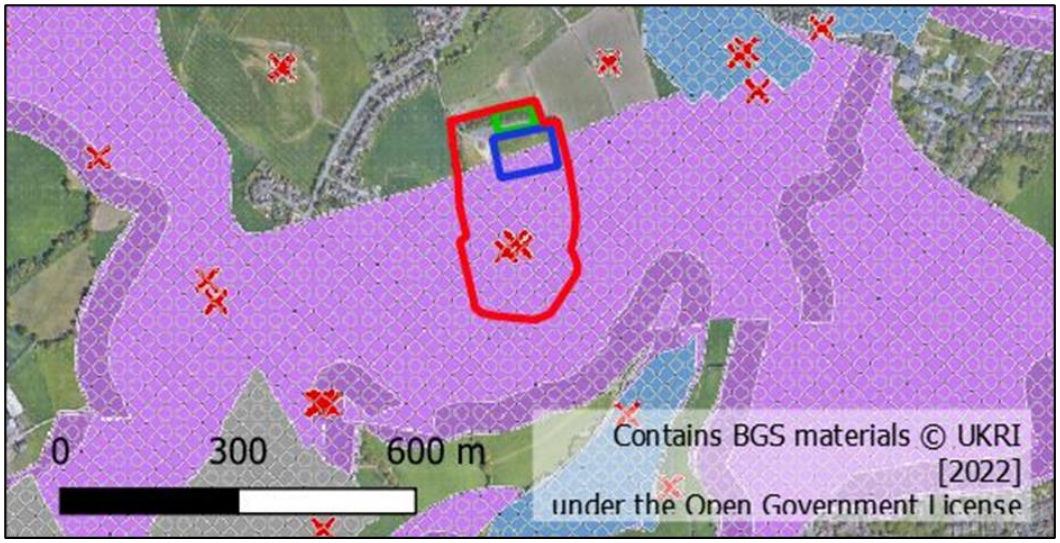


Figure 2-E: Coal Mining Specific Risks. Coal mining development high risk areas (purple), recorded past shallow workings (blue), and mine shafts (red crosses).

2.3.4 In addition to the above, whilst there remain no records of mine shafts on or within 20m of the main development area, the records are incomplete, and thus any circular features within the historical maps could indicate the presence of an untreated mine shaft. Shafts are noted in the southern areas of the wider site historically as outlined in paragraph 2.1.1.

2.4 Hydrology and Flood Risk

2.4.1 The only surface water features in the vicinity of the proposed FTP are a series of becks to the south of the site, which do not appear to flow into any major surface waters.

2.4.2 Environment Agency flood maps indicate that the proposed pitch development and wider site lies within a Flood Zone 1 (typically a low risk of flooding). An extract from the open-source Environment Agency flood risk data in the local area is presented in Figure 2-F below.

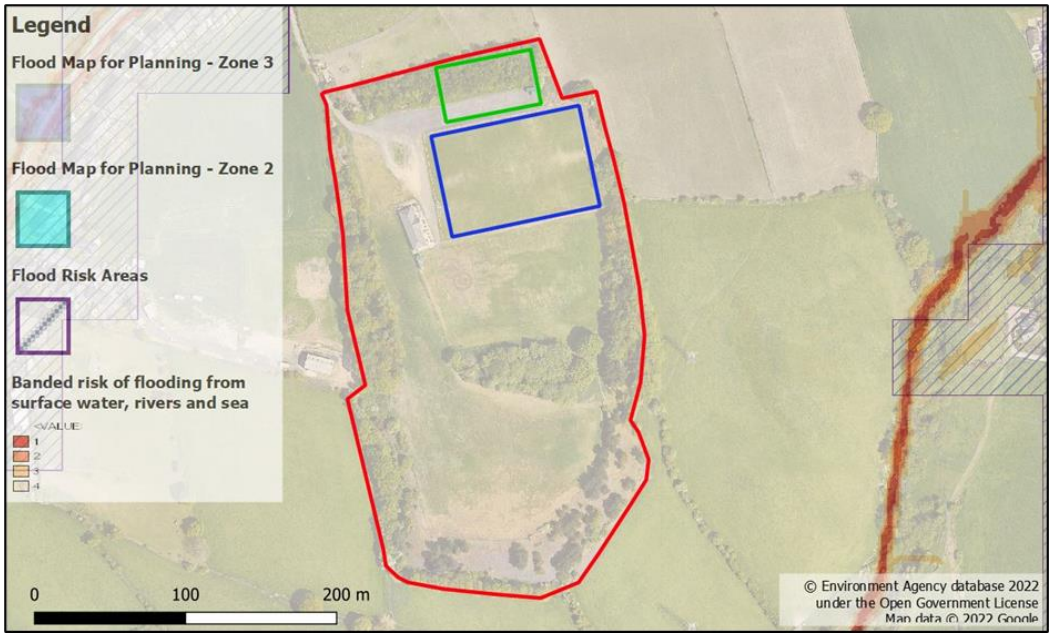


Figure 2-F: Flood risk mapping

2.5 Landfilling

2.5.1 Open-source Environment Agency landfill mapping data shows that no landfill sites are recorded within 250m of the site. There is a historical landfill site just over 300m south-west, as shown in Figure 2-G below.

2.5.2 Artificial ground is recorded across the majority of the wider site; however, this is likely to comprise predominantly of colliery spoil (reworked natural bedrock), with a relatively small content of readily biodegradable organic material.

2.5.3 Based on the above and anticipated ground conditions on site, the risk of impact of ground gases to the pitch development (pitch and floodlights) is considered to be low. The previous ground investigation works identified gas protection measures would be required in proposed buildings (enclosed spaces) in accordance with CIRIA CS-2 conditions.

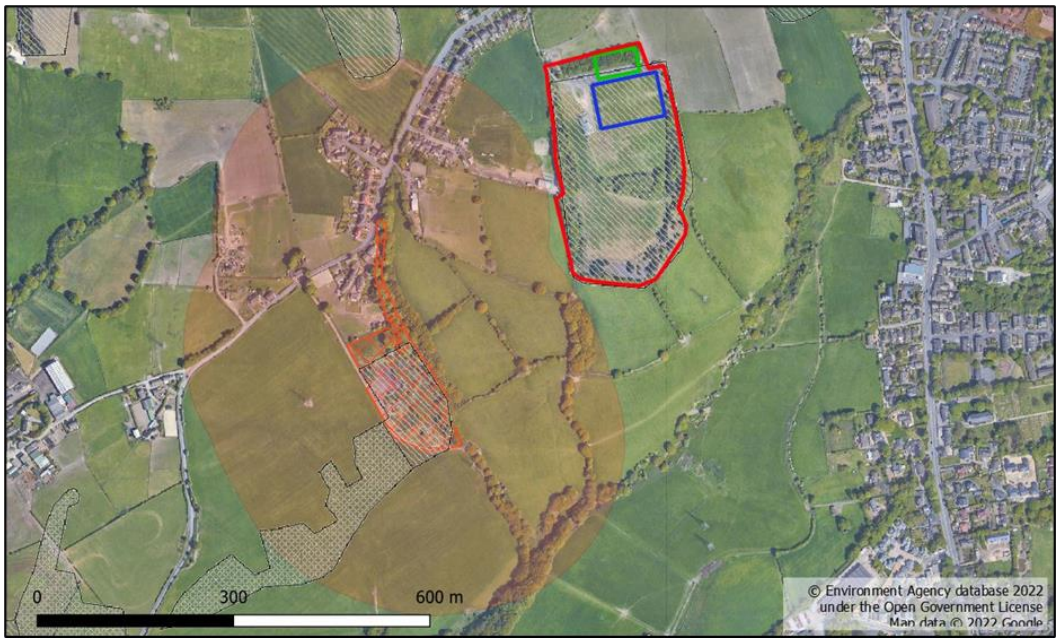


Figure 2-G: Proximity to landfill site (outline of nearest off-site former landfill in red hatching)

2.6 Enquiries with Statutory Undertakers

2.6.1 We have contacted a number of Statutory Undertakers and obtained a Line search report to obtain copies of available records to avoid damaging buried apparatus during fieldwork activities. Copies of their records are appended; however, it should be noted that a foul sewer crosses the area of the existing grass rugby pitch, to the south of the proposed FTP in an east-west direction.

2.6.2 Underground electric cabling feeds the pavilion from the access road to the northwest. Statutory undertaker records do not typically show any details of private runs on site.

2.6.3 Copies of the SU records are included in Appendix B.

3 Fieldwork

3.1 Fieldwork Summary

3.1.1 Fieldwork was initially undertaken on the 8th and 9th September 2022 (Phase 1), with a further investigation undertaken on the 18th November 2022 (Phase 2). The works completed are summarised in Table 2 below. Exploratory hole logs are presented in Appendix C, and an exploratory hole location plan is presented as Drawing 01.

Phase	Exploratory hole ID	Method	Achieved depth (m bgl)	Purpose
1	RBH01 to RBH04	Rotary Boreholes (Air-mist)	10.0 to 30.0	Open hole drilling techniques to prove ground conditions for pitch/floodlights and determine presence/absence of coal seams/workings
	WS01 to WS06	Windowless sampling techniques	3.0 to 5.0	Prove ground conditions for pitch/floodlights
	DP01 to DP04	Dynamic probing techniques	4.6 to 7.8	Prove ground conditions for pitch/floodlights
	DCP01 to DCP06	Dynamic cone penetrometer	0.89 to 0.96	Determine CBR value for proposed FTP
	DCP07 to DCP10	Dynamic cone penetrometer	0.92 to 0.97	Determine CBR value for Grass Hybrid Pitch
	DCP11 to DCP13	Dynamic cone penetrometer	0.37 to 0.95	Determine CBR value for Parking Area
	DCP12, DCP14 and DCP15	Dynamic cone penetrometer	0.32 to 0.97	Determine CBR value for Multi-Sport Training Area
2	HP01 to HP13	Hand Tools	0.3	Sampling for Asbestos screening
	TP01 to TP06	Machine excavated trial pits	2.0 to 2.3	Sampling for Earthworks Grading
	RBH101 to RBH106	Rotary Boreholes (Water-flush)	15.0	Open hole drilling techniques to determine extent of voiding previously identified within RBH01

Table 2: Summary of fieldwork undertaken

3.1.2 All soils and rock encountered were described in accordance with BS 5930:2015+A1 (2020).

3.2 Site Restrictions

3.2.1 During the Phase 1 investigation, the presence of underground services and the existing pavilion building limited the location of rotary boreholes to RBH01-RBH04 due to stand off distances associated to drilling with air-mist techniques into coal measures. Damage to existing grassed pitches also had to be limited, further restricting the locations for the boreholes.

3.2.2 Due to time constraints, rotary borehole RBH04 was terminated at a depth of 10.0m bgl.

3.2.3 There were no onsite restrictions encountered during the Phase 2 investigation, other than keeping investigation location off the existing pitch area.

3.3 Sampling

3.3.1 During the fieldwork, sampling of materials has been undertaken in accordance with BS EN ISO 22475-1 "Geotechnical Investigation and testing – sampling by drilling and excavation and groundwater measurements". Various sampling and sub-sampling methodologies have been adopted, depending on the medium, excavation / drilling method and analysis requirements, with the primary aim of obtaining the highest quality sample class practicable.

3.4 In-situ Testing

3.4.1 Field testing comprised the following tests:

Test type	Applicable standard / guidance
Pocket penetrometer	Manufacturer's instructions
Infiltration test	Principles of BRE 365
Standard Penetration Test (SPT)	BS EN ISO 22476-3
Dynamic cone penetrometer	Highways England Document CS229 Data for Pavement Assessment
Dynamic probing	BS EN ISO 22476-2

Table 3: Summary of field testing undertaken

3.4.2 The raw data from the in-situ testing is presented in Appendix D, and the results are summarised on individual exploratory hole logs where appropriate.

4 Ground Conditions

4.1 Phase 1 Works Overview

4.1.1 The windowless sample borehole (WLS01-WLS06) locations encountered Topsoil or surficial hardstanding overlying Made Ground. Made Ground comprised colliery spoil from 0.4m (WS04) deep up to a maximum depth of 4.2m (WS01), associated with the historic Cross Pit colliery. Made Ground typically comprised black, gravelly, slightly clayey, sand, with gravels consisting of fine to medium, subangular, clinker, brick, and sandstone. Cohesive Made Ground was also noted, within 4No. of the 6No. windowless sampler positions across the north, east and west of site, ranging in depths from 0.7m to 1.6m. Cohesive Made Ground comprised soft to firm, gravelly, clay, gravels consisting of fine, subangular, brick and sandstone. Dynamic probe results indicate Made Ground potentially up to 2.5m-3.0m in thickness at probe locations to the west (DP02-DP04) and 4-5m to the south of the proposed FTP (DP01).

4.1.2 Despite being absent from the BGS records, naturally derived deposits of suspected Glacial Till were noted underlying Made Ground across all WLS positions. This could also represent weathered coal measure deposits. Deposits generally comprised firm to stiff, orangish brown/grey, slightly gravelly clay, gravels consisting of fine, subangular, coal, quartzite and sandstone. Glacial Till deposits were encountered to basal depths ranging from 3.4m to >5.45m bgl in the windowless samples.

4.1.3 Where the base of the Glacial Till was proven, weathered deposits of Pennine Lower Coal Measures were noted, comprising very stiff, friable, grey, gravelly clay, gravels consisting of fine to medium, angular coal and sandstone, extending to a maximum exploratory depth of 5.45m. Top of bedrock was noted as being shallowest in the northwest of the site, at depths of 2.45m and 3.5m bgl.

4.2 Phase 2 Works Overview

4.2.1 During the Phase 2 works, trial pits (TP01 to TP06) were positioned along the northern extent of the site; soils encountered were similar to those observed within the windowless sampling boreholes in this area. Granular Made Ground was also encountered within TP03, TP05 and TP06, typically comprising dark brown, sandy, clayey, gravels of brick and coal, up to depths of 0.4m to 1.5m. Clay/granular mix of Made Ground was noted within TP01, comprising soft, grey, very gravelly, clay, gravels consisting of brick and coal, to a depth of 2.0m. With the exception of TP01, Glacial Till was encountered beneath Made Ground deposits, or from surface in positions where Made Ground was absent. Weathered deposits of Pennine Lower Coal Measures were observed locally beneath the Glacial Till from a depth of 0.8m and 1.0m bgl (TP02 and TP04, respectively).

4.3 Phase 1 Coal Mining Investigation Findings (August 2022)

4.3.1 Rotary open hole drilling techniques were utilised across 4 exploratory positions during the Phase 1 works, as such only the colour and composition of the arisings contained in flush returns provided an indication of the strata type.

4.3.2 Rotary boreholes encountered superficial deposits to depths ranging from 4.0m to 7.5m, overlying bedrock of the Pennine Lower Coal Measures. Bedrock comprised light grey mudstone, with yellow sandstone encountered within RBH04. Interbedded mudstones and sandstones were observed from 21.3m to a basal depth of 30m. Northwest and directly north of the existing FTP, rockhead was encountered at the shallowest depths within RBH01 and RBH02 at 4.0m and 3.4m bgl respectively.

4.3.3 A potential void was noted within RBH01 in the northwest of site at a depth of 8.7m to 9.5m (0.8m thickness), indicated by a loss of drill flush and a drop in the drill string and may represent potential coal seam workings. Intact coal seams were observed within RBH03 and RBH04, 0.5m and 0.2m in thickness respectively and located at a depth of 8.2m bgl. An additional seam was located between depths of 12.6-13.8m in RBH04. It is likely that the coal seams are representative of the shallow Blocking Rider (all rotary hole positions) and deeper Blocking Coal Seam (RBH04 only).

4.4 Phase 2 Coal Mining Investigation Findings (November 2022)

4.4.1 The Phase 1 investigation was supplemented with further rotary exploratory open holes following confirmation of the potential void previously encountered in RBH01. The boreholes encountered superficial deposits to depths ranging from 0.2m to 5.4m, overlying bedrock of the Pennine Lower Coal Measures. All positions showed interbedded mudstone, siltstone, and sandstone to a basal depth of 15.0m. Voids were noted in RBH104 at a depth of 9.6m to 11.1m (1.5m thick) and RBH105 at a depth of 9.1m to 10.1m (1m thick), both of which were indicated by a loss of flush. Positioned to the east of RBH01, the voiding encountered is likely to be indicative of the worked coal seam observed within RBH01.

4.4.2 Further risks associated with coal mining legacy have been assessed within Section 5 below.

4.4.3 Photographs representing the typical ground conditions are presented in the Figures below.



Figure 4-A: Photo of soil profile at WS01



Figure 4-B: Photo of soil profile at WS05

4.5 Groundwater

4.5.1 Groundwater was observed within WS04 northwest of the existing FTP at a depth of 3.4m, remaining constant upon completion. Within the rotary positions, groundwater was observed at a depth of 13.0m within RBH01, 6.0m and 21.0m within RBH03, and 21.3m within RBH04. Groundwater was not encountered within RBH02. Within TP02, perched groundwater was observed at a depth of 1.9m. The volume of groundwater observed was insufficient to fill the base of the trial pit.

4.6 Evidence of Possible Contamination

4.6.1 During the ground investigation works no significant visual or olfactory evidence of contamination was observed, beyond the presence of anthropogenic materials in the Topsoil and Made Ground.

4.7 Obstructions and Instability

4.7.1 The progress of the ground investigation works was not affected by near surface obstructions.

5 Coal Mining Risk Assessment

5.1 Overview of Desk Study

5.1.1 A desk-based Coal Mining Risk Assessment was completed for the site in March 2014 by Ashton Bennett Consultancy, on behalf of Kirklees Council (Report Ref: KC 3147, presented in Appendix A). We recommend that this ground investigation report is not read in isolation to the desk-based risk assessment.

5.1.2 Based upon evidence presented within the report there is a medium to high risk to the proposed development from collapse of possible shallow coal mining (<30m depth) causing subsidence in the future. The Blocking Rider and Blocking Coal seams, which have been heavily mined in the region, are considered to be present at shallow depths.

5.1.3 It was anticipated, based on the likely thickness of superficial deposits, that the Blocking Rider Coal could be located at a depth of c.10-15m and the Blocking Coal at c.20m, with a possibility of both having been worked on site.

5.1.4 In order to quantify the possible land instability risks associated with collapse of unrecorded shallow workings in the Blocking Rider and Blocking Coal seams, intrusive investigations were recommended. These have been undertaken, and consisted of a series of rotary open hole boreholes to target depths of 15-30m to determine the presence of any possible workings (voids) associated with the Blocking Rider and Blocking Coal Seams, as well as determining whether sufficient rock cover exists above the coal seams.

5.2 Intrusive investigations

5.2.1 The rotary logs indicated the following coal seams/voids to be present beneath the site.

Borehole	Location (development area)	Depth of seam (m)	Thickness (m)	Condition
RBH01	Northwest	8.7-9.5	0.8	Void, noted by a loss of drill flush and drop in drill string
RBH03	Centre (south of existing grass pitch)	8.2-8.7	0.5	Intact Black Coal
RBH04	East of existing grass pitch	8.2-8.4	0.2	Intact Black Coal
		12.6-13.8	1.2	Intact Black Coal
RBH104	North of the Northwest corner of the existing pitch	9.6-11.1	1.5	Void, noted by a loss of drill flush

Borehole	Location (development area)	Depth of seam (m)	Thickness (m)	Condition
RBH105	Adjacent to the northwest corner of the existing pitch	9.1-10.1	1.0	Void, noted by a loss of drill flush

5.2.2 Based on information obtained from the Coal Mining Risk Assessment, it is likely that the shallower coal seam encountered relates to the Blocking Rider Coal Seam, likely worked as part of the Cross Pit Coal and Ironstone Mine Workings. The Blocking Coal Seam appeared to be encountered in RHB04 only at 12.6-13.8m bgl.

5.2.3 Made Ground associated with the historical tipping of the Cross Pit Coal and Ironstone Mine Workings was recorded across the entire site, to a depths ranging from 0.4m to 4.2m bgl. Made Ground is inferred as colliery spoil, typically comprising both cohesive and granular deposits with gravels of coal, brick, clinker, and sandstone. The thickness of colliery spoil generally increased towards the south of the site.

5.3 Findings and Recommendations

5.3.1 Site investigations indicated the presence of the Blocking Rider Coal seam beneath the current development area. Coal seams within RBH03 and RBH04 were observed as being in an intact state, with the Blocking Rider Coal seam encountered at 0.2m and 0.5m in thickness, and the deeper Blocking Coal seam encountered at 1.2m in thickness. Observations were made through arisings returned in the drilling flush.

5.3.2 The initial rotary borehole investigation undertaken during Phase 1 works found evidence of coal seam workings in the north-western section of the site in RBH01, with a void/broken ground recorded at a depth of 8.7-9.5m bgl (0.8m thickness), as indicated by a loss of flush and a drop in the drill string.

5.3.3 Boreholes RBH103 and RBH106 to the south and southeast of RBH01 were taken to a depth of 15.0m during an additional investigation phase without encountering coal seams or voiding. It is noted that at depths ranging from 9.5m to 13.2m, mudstone with dark grey intrusions (likely organic rich mudstone/poor quality coal) were observed across both positions.

5.3.4 Voiding was encountered within RBH104 at a depth of 9.6m to 11.1m (1.5m thick) and RBH105 at a depth of 9.1m to 10.1m (1m thick) to the east of RBH01. Both voids were identified through a loss in the drilling flush and are likely form part of the same worked coal seam identified within RBH01. No coal seams or voiding was noted in boreholes RBH02. As such, it is likely that the potential mine working is confined to the north-western part of the wider site (proposed parking area and northern extent of multi-sport training area), which extends towards and beneath the north-western part of the proposed FTP. This could affect foundation design for both floodlights and the proposed pitches, and car park construction.

5.3.5 Boreholes RBH101 and RBH102 were positioned adjacent to the south-eastern and north-western corners of the existing pavilion building respectively. Both boreholes reached a depth of 15.0m without encountering any coal seams or voiding. Although still possible, it is unlikely that the worked coal seam extends beneath the planned pavilion extension.

5.3.6 Using guidance contained within CIRIA C758D, assuming a typical bulking factor of 30% within coal measures and a conical collapse mechanism, if the roof of the working collapsed, the resultant void could potentially migrate to surface level.

5.3.7 The presence of voiding within RBH01 and RBH104-105 indicates that the likely worked coal seam may be present beneath the proposed car parking, multi-sport training area, and north-western part of the FTP. Based on the investigations completed in these areas, natural glacial soils are likely to be competent enough to support a shallow foundation solution for such aspects (more details presented in Section 7), thus, any stresses from associated structures are unlikely to stress the roof of the potential void/working at depths of c.8.5m bgl and promote collapse. However, collapse could still occur, albeit the likelihood is low given the time elapsed since coals were potentially worked.

5.3.8 Although we have not encountered voiding elsewhere on site this could be because rotary boreholes have penetrated coal pillars (supporting a working) as opposed to worked ground.

5.3.9 For the proposed pavilion, the RGS 2016 GI report recommends that mini piles advanced to a depth between 5.0m and 7.0m are adopted due to the depth of Made Ground (confirmed in WS01), obtaining support in the Glacial/bedrock deposits. There was no evidence of shallow coal seams or voids in the areas of RBH101 and RBH102, therefore the risk of shallow coal mine workings being present and affecting the development is considered to be low.

5.3.10 Due to the above, and the fact that shallow workings are unlikely to extend beneath the pavilion, it is unlikely that any remedial work on the site with regard to the coal workings will be required. Engineering assessments with regards to the proposed pitches/car parking and the effect such could have on coal mine workings in the northwest part of the site are discussed further in Section 7.

5.3.11 If development proposals changes, this assessment will require review.

6 Laboratory testing

6.1 Overview

6.1.1 Upon completion of the fieldworks, selected samples obtained from exploratory holes were sent to independent laboratories for geotechnical testing.

6.1.2 The testing schedules were developed by Soiltechnics taking cognisance of the scheme proposals and based on the initial findings of the fieldworks.

6.2 Geotechnical Testing

6.2.1 Laboratory test certificates are presented as Appendix E, and the total number of geotechnical tests undertaken is summarised in Table 4 below:

Geological Unit	Test	Quantity
Made Ground (colliery spoil)	Liquid Limit/Plastic Limit/Plasticity Index	5
	BRE SD1 Suite D (brownfield – pyrite present)	2
	Particle size distribution (sieving above 63micron)	4
	Dry density / moisture content relationship 2.5kg hammer	1
	Moisture Content	8
Glacial Till	Liquid Limit/Plastic Limit/Plasticity Index	6
	BRE SD1 Suite D (brownfield – pyrite present)	1
	Particle size distribution (sieving above 63micron)	2
	Dry density / moisture content relationship 2.5kg hammer	2
	Moisture Content	7
Pennine Coal Measures	BRE SD1 Suite D (brownfield – pyrite present)	1

Table 4: Summary of geotechnical laboratory testing

6.3 Chemical Testing

6.3.1 Chemical laboratory test certificates are presented in Appendix F, and the total number of chemical tests undertaken is summarised in Table 5 below:

Geological Unit	Testing Suite	Quantity
Topsoil (Made Ground)	ST Basic classification suite (Metals, inorganics, PAH, banded TPH, asbestos)	1
	Organic Matter Contents	1
	Speciated Polycyclic Aromatic Hydrocarbons (PAHs)	7

Geological Unit	Testing Suite	Quantity
	Asbestos quantification (on a tested positive sample)	1
	Asbestos Screening	12
Made Ground (colliery spoil)	ST Basic classification suite (Metals, inorganics, PAH, banded TPH, asbestos	2
	Organic Matter Contents	2
	Full WAC Suite (2-stage leachate)	2
	Speciated PAH	4

Table 5: Summary of chemical laboratory testing

7 Chemical Assessment

7.1 Topsoil suitability

7.1.1 A composite sample of the Topsoil was taken from across all WLS borehole positions. The composite sample was tested for the sole purpose of assessing the suitability of such soils for reuse onsite within the existing playing fields. As such we have adopted generic screening values based upon a 'Public Open Space (Park)'.

7.1.2 Our assessment of laboratory test data has been carried out using Suitable for Use Levels (S4ULs). These screening values have been used as a preference; however, where published S4ULs are not available, we have adopted C4SLs (Category 4 Screening Levels), or soil screening values derived by Atkins.

7.1.3 Our analysis is presented in Appendix G, and the following table summarises the outcome of the Topsoil analysis.

Receptor group	CLEA model	Inorganic contaminants	Organic contaminants
Park users (child), no plant uptake	Public Open Space (Park)	No exceedances	No exceedances

Table 6: Summary of chemical analysis

7.1.4 Based on the above, the testing indicates that the Topsoil in-situ would be chemically suitable for reuse on-site and offsite within a Public Open Space (Park) usage.

7.1.5 During Phase 1 works, asbestos was detected within a composite sample of the Topsoil. Upon quantification of this, it is noted that the total concentration of asbestos measured was trace (<0.001%). Asbestos was not recorded in any other sample tested within the Phase 1 investigation.

7.1.6 Further topsoil testing undertaken during Phase 2 works to determine if asbestos was widespread or an isolated occurrence. Asbestos screening was performed on Topsoil samples collected from 12No. hand pits across the development area. The results show that asbestos was not present in any of the additional 12 samples analysed.

7.1.7 On this basis it is recommended that a toolbox talk is undertaken regarding the risks of encountering asbestos during typical excavation, along with adoption of appropriate PPE and good hygiene practices.

7.2 PAH Testing

7.2.1 Elevated PAH concentrations were previously recorded during the RGS 2016 investigation within the colliery spoil Made Ground in WS3 (north elevation of existing pavilion) at a depth 0.4m bgl. The exceedances of PAHs in the previous investigation were assessed against ATRISK soil screening values (SSVs) based on playing fields land usage, developed in 2009.

7.2.2 Additional sampling was carried out by RGS in 2016, including 4 No. additional locations local to the elevated concentration measured in WS3. Results indicated that the measured concentrations of PAHs fell below guidelines. As such, remediation of the area local to WS3 was recommended, based on excavation of a 5x5m area with subsequent validation and infilling.

7.2.3 Following review of previous investigations, a Public Open Space (Park) scenario is considered more applicable given the intended end usage, similarly used in the Topsoil assessment presented in Section 7.1.

7.2.4 As part of the Phase 1 investigation, 11 No. additional speciated PAH test suites have been carried out by Soiltechnics within Topsoil (7 No.) and Made Ground deposits (4 No.) from all WLS borehole positions across the site using current Suitable for Use Levels (S4ULs) and Category 4 Screening Levels (C4SLs) for Public Open Space (Park) as guideline values, based on 1% SOM. Results indicate that PAH levels within all samples are within guideline values and therefore no remedial measures are considered necessary for the pavilion or pitch development. Analysis is presented in Appendix G. In addition to those 11 samples, a further 3 No. samples have been tested, representing a bulk sample of Topsoil (0.0-0.1m depth) and 2 No. bulk samples of Made Ground (0.3-1.4m depth and 0.2-1.8m depth). Again, all concentrations of PAHs measured fall below the respective guideline values.

7.2.5 We have also cross referenced previous test results from the original RGS SI and those additional investigations from 2016. All measured concentrations of PAHs fall below the guidelines for the land use utilised in this assessment, with the exception of a single concentration of dibenzo(a,h)anthracene (1.3mg/kg compared to S4UL of 1.1mg/kg), in addition to benzo(b)fluoranthene (30mg/kg compared to S4UL of 13mg/kg), benzo(a)pyrene (24mg/kg compared to C4SL of 21mg/kg) and Dibenzo(a,h)anthracene (4.4mg/kg compared to S4UL of 1.1mg/kg) from the original location of WS3.

7.2.6 Based on the above assessment, whilst there is evidence of elevated PAH contamination at the site, 3 of the 4 elevated concentrations are very marginal, with the single elevated concertation of benzo(b)fluoranthene most significant. However, in consideration of the 21 No. samples tested to date across the site during both RGS and Soiltechnics investigations, only a single concentration of benzo(b)fluoranthene has been noted to be of any significance. Based on such, the likelihood of significant harm being caused to human health is considered to be low, and remedial measures are not required.

7.3 Ground Gas Assessment

7.3.1 Ground gas monitoring was undertaken over four (4No.) monitoring rounds by RGS in 2016 (including 2No. rounds during worst-case low atmospheric pressure <1000 mbar). Methane concentrations were recorded as 0.0% v/v on all occasions and carbon dioxide was recorded between 1.4-5.3% v/v. Maximum flow rate was recorded as 0.3l/hr. A Characteristic Situation 1 (CS1) was indicated based on the carbon dioxide gas screening value (GSV) of 0.053l/hr, however due to the maximum recorded concentration of carbon dioxide of 5.3% a designation of CS2 was attributed to the site and ground gas protection measures recommended for the proposed new pavilion extension.

7.3.2 The designation of CS2 for the site is considered overly conservative given the carbon dioxide concentrations were only in excess of 5.0% on a single visit in one borehole, with <5.0% on all other occasion. An average concentration for carbon dioxide of 3.5% can be calculated during worst case atmospheric conditions (<1000 mbar).

7.3.3 Given the flow rate is very low (0.3l/hr max), only one visit recorded carbon dioxide very marginally above the 5.0% threshold (5.3%) at which consideration would be given to increasing the site characteristic situation to CS2, proposed end usage, low biodegradable content noted and the age of the colliery spoil, a site characterisation of CS1 is considered more characteristic. Therefore, in our opinion, no ground gas protection measures are considered necessary in new buildings.

7.4 Waste disposal

7.4.1 We have undertaken sampling to characterise the insitu soils encountered on site for the potential disposal to landfill. Our assessment includes a hazardous waste classification, in accordance with WM3 (v1.1), and a Waste Acceptance Criteria assessment, in accordance with the current requirements published by the government.

7.4.2 Two composite samples of the Made Ground were obtained from both cohesive deposits and granular deposits of the colliery spoil encountered on site. Cohesive soils from WS05 (north of site), WS03 (northeast of site), and WS06 (west of site) were obtained from depths between 0.3m to 1.4m, and referenced as WAC01. Granular soils from WS03, WS02 (south east of site), and WS01 (south west of site), were obtained from depths between 0.2m to 1.8m and referenced as WAC02. A composite sample of the Topsoil referenced TS01 was also obtained (also utilised for the assessment in Section 7.1 above).

7.4.3 The assessment sheets are enclosed within Appendix H, and a summary of the findings is presented in the Table 7 below.

Stratum	Hazardous classification	Landfill classification
Topsoil	Non-hazardous	Topsoil is typically unsuitable for disposal to inert landfill sites due to high organic carbon content.
Cohesive Made Ground	Hazardous	Hazardous waste landfill due to high total organic carbon and TPH
Granular Made Ground	Hazardous	Hazardous waste landfill due to high total organic carbon. The TOC content exceeds the hazardous waste threshold and may require pre-treatment prior to being taken to a landfill, subject to landfill operators policy
Natural soils	Non-hazardous	Inert based on soils being of natural original and unaffected by artificial contamination

Table 7: Summary of waste characterisation testing

7.4.4 The assessments indicate that the upper Topsoil may be classified as inert non-hazardous while the granular and cohesive colliery spoil materials are likely to be classified as hazardous waste due to high organic content.

7.4.5 It is recommended that colliery spoil materials are re-used on site as far as possible to reduce abnormal costs from off-site disposal of hazardous waste. This would need to be undertaken in accordance with a Material Management Plan (MMP). If disposed offsite, some deposits may require pre-treatment, but this would be at the landfill operators discretion.

8 Engineering Assessment

8.1 Ground Conditions Summary

8.1.1 Made Ground colliery spoil was encountered across the site, extending to depths between 0.4m and 4.2m, deepest to the south of the existing pitch. This is consistent with the recorded position of the former Cross Pit in the southern part of the wider site.

8.1.2 Beneath Made Ground, suspected Glacial Till deposits overlying weathered deposits of the Pennine Lower Coal Measures Formation were observed. Glacial Till deposits were encountered to depths ranging from 3.4m to greater than 5.0m (up to 7.5m indicated in rotary boreholes). Weathered deposits of the Pennine Lower Coal Measures Formation were observed to the north and west of the existing pitch at depths of 2.45m to 3.5m. Bedrock was present from depths of 3.4-4.0m in similar areas, deepening to depths of 5.5m to 7.5m to the east and south of the site. Bedrock was also noted in rotary open holes RBH104-105 from depths of 0.2-0.9m in the proposed car parking area, however this is not consistent with soils observed in similar placed holes, such as WS04.

8.2 Abnormal Ground Conditions

8.2.1 As described in Section 4, granular colliery spoil type Made Ground typically comprised black, gravelly, slightly clayey, sand, with gravels consisting of fine to medium, subangular, clinker, brick, and sandstone. Cohesive Made Ground was also noted, comprising soft to firm, gravelly, clay, gravels consisting of fine, subangular, brick and sandstone. Deep Made Ground was observed to the south of the existing pitch, in the area of the proposed pavilion and along the southern boundary of the proposed multi-sport training area, up to a maximum proven depth of 5.4m. Made Ground deposits typically exhibited very loose to loose density characteristics.

8.3 Floodlight Foundations

8.3.1 In our opinion the naturally deposited clay soils of the Glacial Till will adequately support pad foundations for the proposed floodlight bases. As the natural Glacial Till deposits comprise clays the following assessments are based on soils exhibiting cohesion. Deposits of Made Ground across the site will not provide adequate support to proposed floodlights.

8.3.2 Laboratory testing indicates the soils are of medium volume change potential and thus, foundations should extend a minimum of 0.9m depth below proposed ground level subject to penetrating the naturally deposited soils by a minimum of 0.3m. Based on depths of Made Ground encountered in the northern and north-western parts of the site (RBH01, RBH02, RBH104-106 and WS03-WS06), foundation excavations could reach depths of 0.9m to 1.9m below existing ground levels in such areas. In addition, the mature trees which border many parts of the site will need consideration and could have an effect on overall foundation depth.

8.3.3 Within areas of deeper Made Ground in the far west, south and southwest of the site, traditional foundation excavations would likely reach depths of 3.1m to 4.5m below existing ground levels (based on RBH03, RBH04, RBH103, WS1 & WS2). Clearly this will be difficult to practicably achieve. In such instances it is anticipated that a piled foundation solution will need to be adopted, penetrating the Made Ground and obtaining support in the underlying naturally derived Glacial Till/bedrock of the Pennine Lower Coal Measures. Our rotary borehole records presented in Appendix C and may be considered adequate to assist with pile design by a specialist piling contractor. The difficulty of driving/boring piles through the soils will need to be considered by any specialist piling company and will affect the method of pile installation.

8.3.4 Alternative ground improvement techniques could also be considered, such as rapid impact compaction (RIC), under advice from a specialist.

8.3.5 All floodlight foundations will need to take into consideration the possible presence of shallow coal workings, as detailed in Section 5. Based on data collected to date, the likelihood of mine workings being present in areas where piled foundations are potentially required (southern boundary of multi-sport training pitch, and southern and partly eastern/western boundaries of the FTP) is considered to be low. In addition, it is anticipated that stresses from any shallow pad type foundations located in natural soils will not stress and promote collapse of the roofs to mine workings located in the northwest of the site.

8.3.6 The lighting column foundations will be eccentrically loaded thus stresses imparted to the ground will not be uniform. As a result of the long-term stresses, the settlement in turn may not be uniform. Such stresses are likely to be from dead loads only and not from live loads (such as wind), which will be transient and not likely to contribute to settlement. Live loads will increase the eccentricity of loads and thus increase the concentration of stresses potentially to an edge of the foundation. In such cases, there is a risk of foundation failure about one edge of the foundation as soils fail in a circular mode. In order to minimise the risk of such a foundation failure, the presumed bearing capacity should not exceed 5.52 x undrained shear strength divided by a factor of safety of 3.

8.3.7 Based on our understanding of the ground conditions, we have adopted a conservative undrained shear strength of 100kN/m^2 for design purposes. Based on the above equation, the presumed bearing capacity to limit the effects of eccentricity should not exceed 180kN/m^2.

8.3.8 The results of calculations undertaken to determine the bearing values for pad type foundations are presented in Table 8 below.

Plan size of pad (m)	Ultimate bearing value (kN/m^2)	Presumed bearing value (kN/m^2)	Allowable bearing pressure (kN/m^2)
1.0 x 1.0	935	180	180
1.5 x 1.5	885	180	180
2.0 x 2.0	865	180	165

Table 8: Bearing values

8.3.9 The presumed bearing value has been derived from the ultimate bearing value by applying a factor of safety of 3 and adopting the lesser value when compared with the eccentricity value derived in paragraph 8.3.6. The presumed bearing capacities given above should not be exceeded in any loading cases. The allowable bearing capacity is derived assuming a constant, uniformly applied load, with a settlement limit of 25mm.

8.3.10 It is noted that site levels fall by a number of meters across the proposed development areas. If a notable cut and fill is required to facilitate development, foundation excavations will need to penetrate any fill material placed, ensuring adequate penetration of the underlying natural soils to obtain support for pad foundations.

8.4 Earthworks

8.4.1 The levels fall from north to south. Accordingly, some earthworks are required in order to provide level development platforms. It is proposed to cut material from the north and place to the south.

8.4.2 Ground conditions in the north are anticipated to comprise Made Ground overlying Devensian Till. Earthworks classification testing has been undertaken and indicates that the Made Ground comprises a Class 1A or 1B General Granular Fill whereas the Devensian Till comprises a Class 2C Stony Cohesive Fill.

8.4.3 Compaction testing undertaken on Devensian Till samples indicate a maximum dry density of 1.85Mg/m^3 with an optimum moisture content of 14 – 15%. In order to achieve 95% compaction, subject to a maximum 10% air voids, the acceptable moisture content range would be 12 – 18%.

8.4.4 Fifteen samples were tested to determine their natural moisture content. 9 of the 15 indicated a moisture content greater than 18%. On this basis it is estimated that 60% of the in situ Glacial Till would be unsuitable for re-use without some form of conditioning. It must be noted that the findings are based on the condition of soils at the time of analysis.

8.4.5 It is likely that the granular material following mixing would be suitable for reuse.

8.4.6 It is recommended that the earthworks are undertaken in accordance with the Specification for Highway Works Series 600. The earthworks should be validated throughout the operations and upon completion.

8.5 Artificial Pitch and Car Park Foundations

8.5.1 We have determined CBR value for the proposed artificial pitch, hybrid pitch, car park, and the multi sports training area foundations using in-situ Dynamic Cone Penetrometer testing following the methodology defined by the Highways England Document CS229 Data for Pavement Assessment. The results are presented in Appendix D and the location of test positions are shown on Drawing 01.

8.5.2 We anticipate that the proposed artificial sports pitch/hybrid pitch foundations and car park pavement will be located existing ground levels with the formations located variably on shallow Made Ground materials, following removal of any Topsoil type material. At present it is also likely that the formation for the proposed car park, multi sports training area and potentially the hybrid pitch will also span natural Glacial soils. In addition, due to the fall in levels across the site, it is likely that a significant cut and fill operation will be required to facilitate development of the site.

8.5.3 Based on the traditional founding depth and our understanding of the ground conditions, CBR design values of 5% for the FTP, 8% for the Grass Hybrid Pitch and parking area, and >10% for the Multi-sport training area have been established across the site. The placement and extent of conditioning applied to any fill placed at the site exceeding depths of 0.6m will dictate the CBR value used in design. In addition, if cut depths exceed c.1m, CBR values for formation material should be reassessed prior to construction.

8.5.4 It should be noted that DCP13 could not be advanced beyond the surfacing it that location so no test data is available.

8.5.5 Due to the variable composition/strength/density (the latter particularly evident in CBR test data) and thickness of Made Ground at the site, particularly in southern areas of the proposed FTP, we recommend that such soils present at and below formation levels are appropriately conditioned to achieve a more consistent level of compaction and minimise levels of total and differential settlement across the proposed pitches and car parking areas.

8.5.6 Once formation levels have been established it is recommended that the formation be trimmed and rolled following current requirements of the Highways Agency Specification for Highways Works (clause 616) (refer www.dft.gov.uk/ha/standards/ mchw/vol1). Such a process will identify any soft/loose areas, which we recommend be either excavated out and backfilled with a suitable well compacted material similar to those exposed in the sides of the resulting excavation, or large cobbles of a good quality stone rolled into the formation to stabilise the ‘soft/loose’ area.

8.5.7 Alternatively, consideration should be given to excavating, sorting and compacting the initial 1m depth of Made Ground to achieve consistent levels of compaction across the pitch and car parking footprint and minimising the potential effects of differential settlement, in addition to the use of a geosynthetic reinforcement.

8.5.8 In addition, increasing and homogenising the density of the Made Ground through ground improvement techniques such as dynamic compaction or permeation grouting/lime & cement stabilisation could be undertaken. These are notably expensive and would require specialist input at the feasibility stage.

8.5.9 The fact that the natural clay subgrade soils are likely to be deemed frost susceptible will probably be the overriding criteria for pavement foundation design purposes. It should also be noted that the thickness of the pavement foundation also relates to the amount and loading from construction traffic, which is discussed in detail in the Transport and Road Research Laboratory (TRRL) Report LR1132 ‘Structural design of Bituminous Roads’.

8.5.10 The cohesive nature of the natural clay soils, and localised Made Ground, will render them moisture susceptible with small increases in moisture content giving rise to a rapid loss of support to construction plant. We therefore recommend, as soon as formation is trimmed and rolled, that sub-base is laid in order to avoid deterioration of the subgrade in wet or frosty conditions.

8.6 Drainage and Infiltration Potential

8.6.1 The Glacial Till soils were encountered as a cohesive material, which typically exhibit low permeability. Indicative infiltration testing was undertaken in WS05 which was cased to the 3.0m basal depth of the borehole. During the test, the borehole was filled to 0.64m bgl and marginal infiltration was observed with water level falling by 0.24m to 0.88m bgl. The infiltration rate was measured as 5.97E-07 m/s. Records are presented in Appendix D.

8.6.2 On the above assessment of the ground conditions, the Glacial Till soils are not considered amenable to the use of soakaway type systems, thus an alternative drainage solution will need to be adopted. Soakaways within the deep Made Ground are not recommend due to the potential for leachate generation and collapse settlement of void space leading to loss of support of surface local to the chamber.

8.6.3 It should be noted that testing has not been strictly carried out in accordance with BRE Digest 365 (2016) "*Soakaway Design*". However, on review of the results and ground conditions encountered, the testing is considered to be sufficient to inform the drainage strategy.

8.6.4 No existing soakaway features were observed on site during our ground investigation works; however, a full drainage survey was not undertaken.

8.7 Aggressiveness of the ground to buried concrete

8.7.1 The aggressiveness of the ground with respect to buried concrete has been assessed in accordance with British Research Establishment Special Digest 1: Concrete in Aggressive Ground Third Edition (2005).

8.7.2 The site is interpreted to be a brownfield site where pyrite is likely to be present.

8.7.3 The classification of each strata is presented in Table 9 below:

Stratum	Design sulphate classification	Aggressive chemical environment for concrete classification
Made Ground	DS-2	ACEC-1s
Devensian Till	DS-1	ACEC-1s
Weathered Pennine Lower Coal Measures Formation	DS-2	ACEC-1s

Table 9: Summary of the aggressiveness of the ground to buried concrete

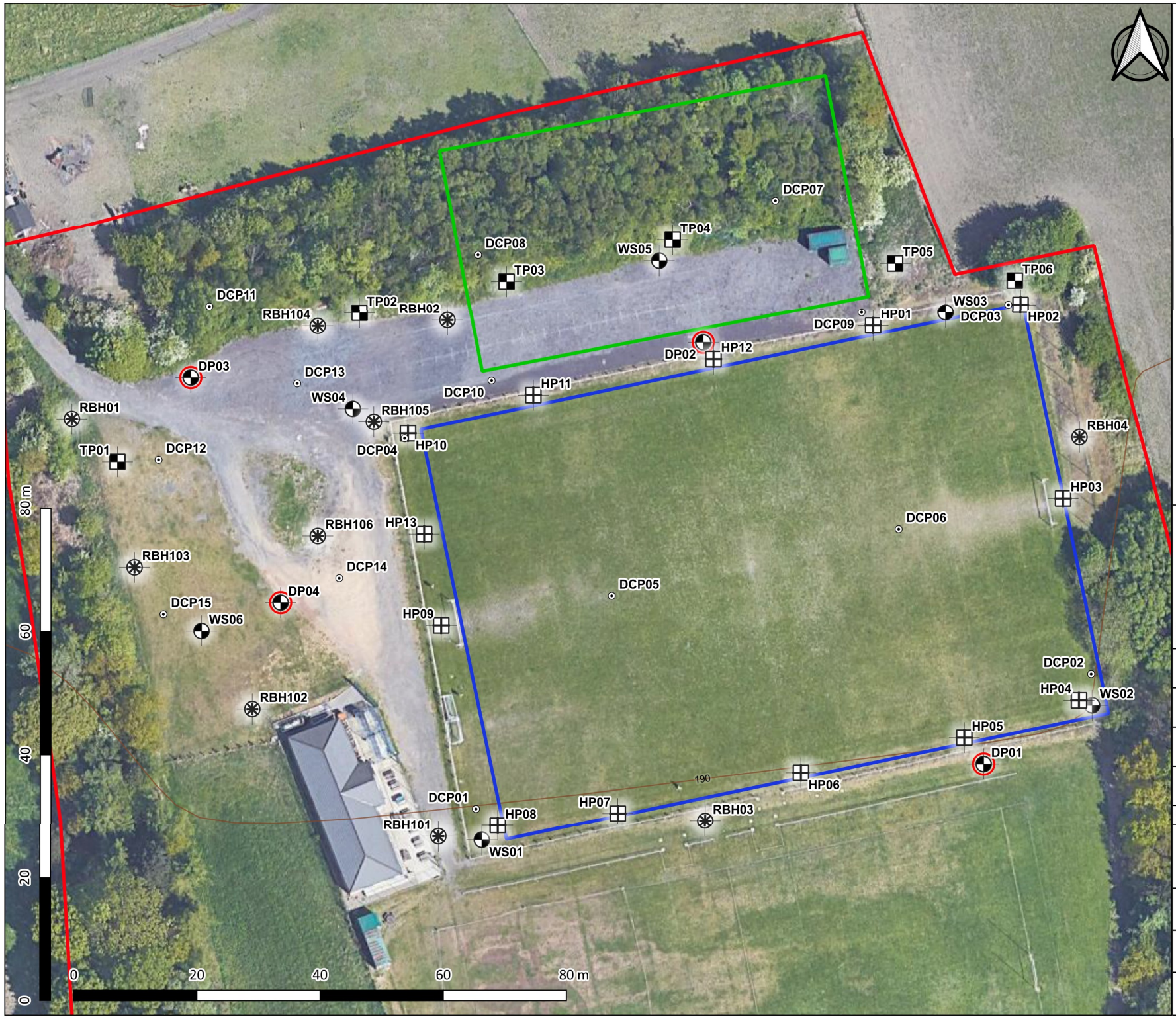
8.7.4 Where two or more classifications are presented, the worst case should be adopted for concrete in contact with all soil types.

8.8 Recommendations for further works

8.8.1 No further investigation works are considered necessary.

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environmental ▪ geotechnical ▪ building fabric

Drawings



Key:

- Site Boundary
- 3G Synthetic Pitch Boundary
- Grass Hybrid Pitch Boundary
- Rotary Openhole Borehole
- Windowless Sample Borehole
- Dynamic Probing
- Machine Excavated Trial Pit
- Hand Pit
- Dynamic Cone Penetrometer Tests

Notes

1) Base image provided by Google.

2) All drawn features are approximate.

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REV	DATE	COMMENT ON VARIATION
B	Jan 2023	Second Issue
A	Aug 2022	First Issue

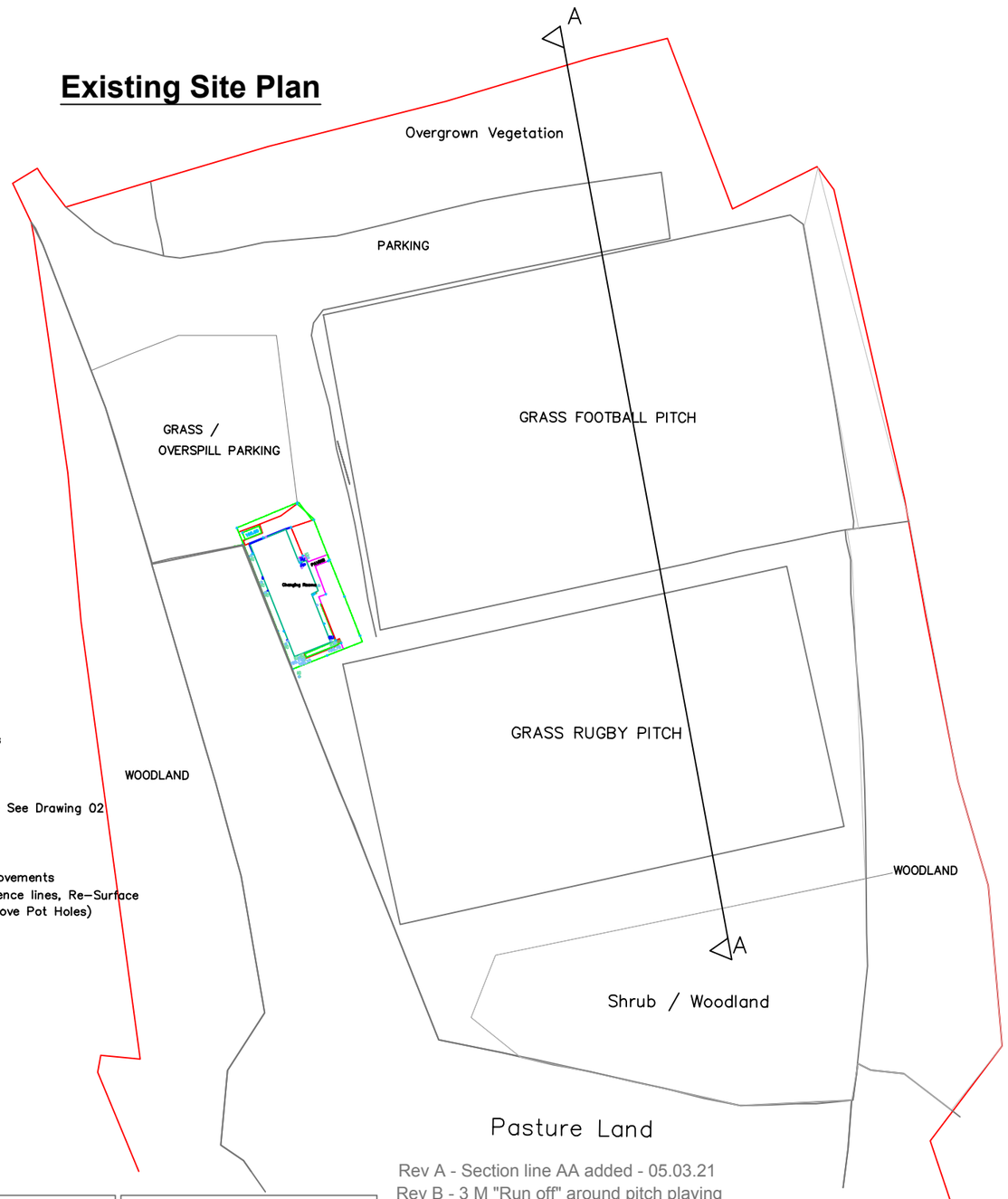
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PROJECT
East Bierley SCA, Bradford

TITLE
Exploratory Hole Plan

PROJECT No.	DRAWING	REVISION
STU5725	01	B

Existing Site Plan

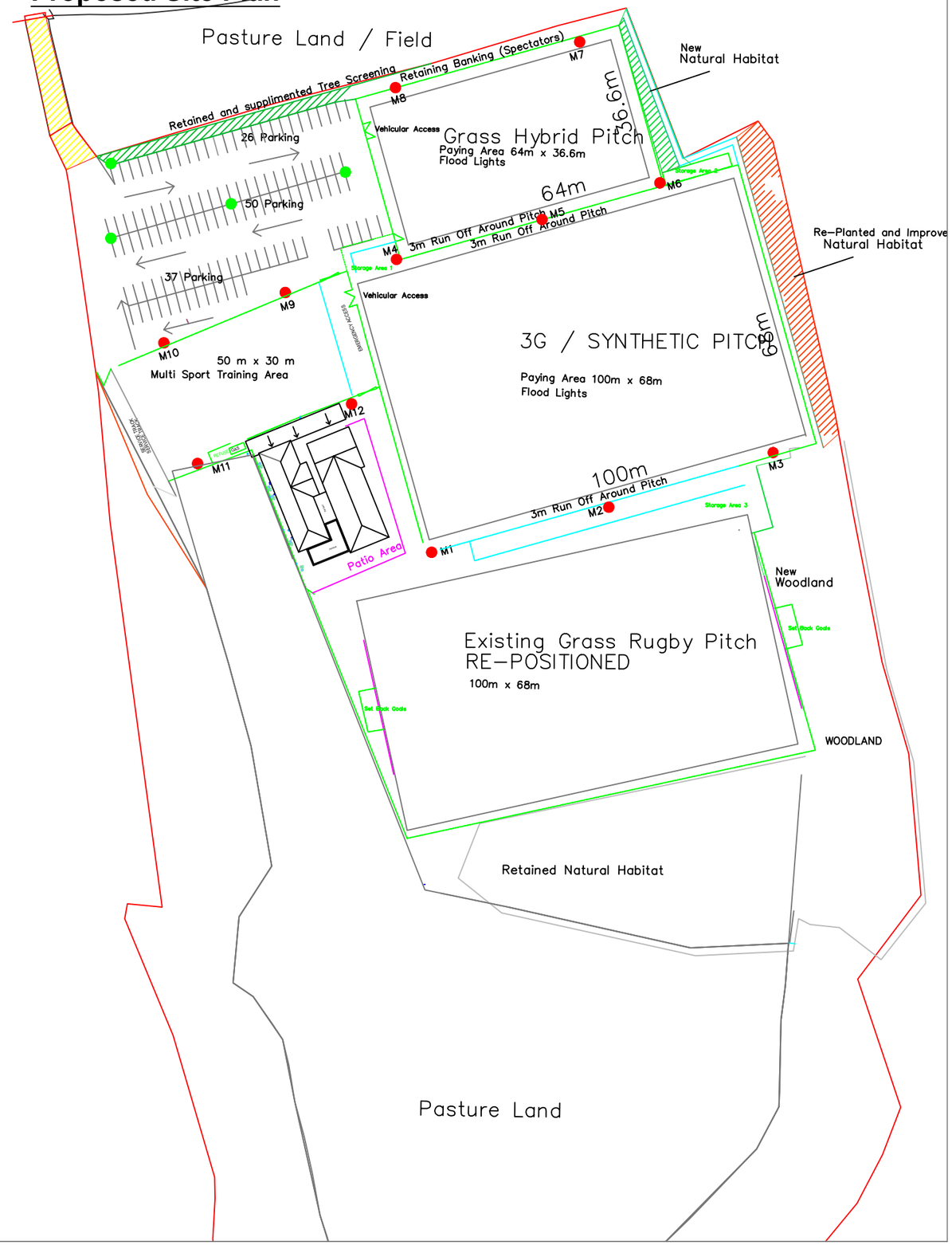


New Build Structures

New Pasture Land – See Drawing 02

Entrance Track Improvements
(Widen to existing Fence lines, Re–Surface
With Gravel and remove Pot Holes)

Proposed Site Plan



Client	East Bierley Community Sports Association		
Title	Existing & Proposed Site Plan		
Project	Estates Strategic Plan		
Job No.	EBSCA_02	Dwg No.	04G - Draft
Scale	Date	Drawn	Checked
A3@1:1250	Nov 20	AW	SA

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Rev A - Section line AA added - 05.03.21
Rev B - 3 M "Run off" around pitch playing area clarified 07.03.21
Rev C - Five aside pitch re-located to and changed to MUGA & Car park layout amended, Changing facilities re-located - 13.03.21
Rev D - Key changed on new building. Pitch Lighting added
Rev E - 3G/Synthetic Pitch swapped with existing Football pitch and Training Area amended, Rugby Pitch Retained and re-positioned, Flood ligting reduced.Car Park Lamp Stands Added
Rev F - Pitchside Storage Areas Added - See Drawing 13

Appendix A Coal Mining Risk Assessment (Ashton Bennett, 2014)

COAL MINING RISK ASSESSMENT

AT

EAST BIERLEY PLAYING FIELDS
BRADFORD

FOR

KIRKLEES COUNCIL

REPORT REF: KC 3147

Engineering Geologists and Environmental Scientists



Ashton Bennett

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COAL MINING RISK ASSESSMENT

AT

EAST BIERLEY PLAYING FIELDS
BRADFORD

FOR

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REPORT REF: KC 3147

ASHTON BENNETT CONSULTANCY

Engineering Geologists & Environmental Scientists

MARCH 2014

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1 INTRODUCTION

2 THE SITE
- 2.1 Site Description
- 2.2 Site History

3 REPORT OBJECTIVE AND REPORT SCOPE

4 SITE GEOLOGY
- 4.1 Geology
- 4.2 Geological Faults

5 MINING
- 5.1 The Coal Authority Report
- 5.2 Deep Coal Mining
- 5.3 Shallow Coal Mining
- 5.4 Mine Shafts

6 RISK ASSESSMENT

7 CONCLUSIONS AND RECOMMENDATIONS

8 GENERAL REMARKS

APPENDICES

APPENDIX A	Archival Maps
APPENDIX B	Coal Authority Report
APPENDIX C	Photographs



1. INTRODUCTION

This report describes the results of a Coal Mining Risk Assessment (CMRA) undertaken on a site known as East Bierley Playing Fields, Hunsworth Lane, East Bierley, Bradford BD4 6PU, West Yorkshire. The work was undertaken on behalf of the client Kirklees Council. The assessment was carried out by this Consultancy, the Ashton Bennett Consultancy.

The purpose of this coal mining risk assessment was to assess the risk of past shallow underground coal mining being present beneath the site and potentially affecting proposals to redevelopment on the site. The mining risk assessment involved the collation and assessment of available information on the site including geological maps, topographical maps, available borehole records and a Coal Authority Report.

This report describes the research work carried out, presents the results of the coal mining risk assessment and assesses the risk to the site from deep and shallow underground coal mining and disused mine shafts.

2. THE SITE

2.1 Site Description

The site is located on the south side of the town of Bierley to the south east of Bradord in West Yorkshire, BD4 6PU. The site lies to the south east of Hunsworth Road, south of a pavilion and immediately south west of a football pitch. There are several containers in the south of the site for storage. The ground was generally level with an elevated area in the centre of the site and some rough ground and trees.

The site is bounded to the north by a pavilion and open recreation ground. The site is bounded to the south by open recreational ground. The site is bounded to the east by a football pitch open ground and the A651 Bradford Road beyond. The site is bounded to the west by open ground and residential housing fronting onto Hunsworth Lane.

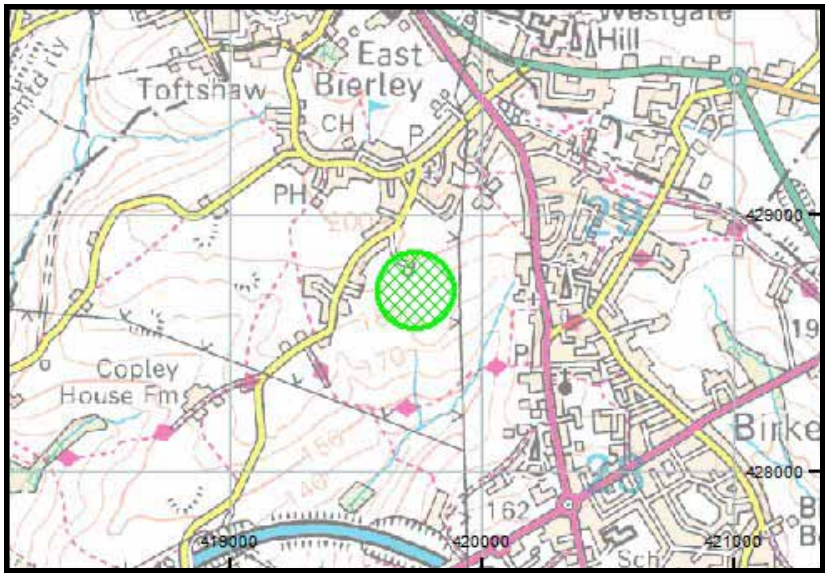


Figure 1 Site Location Plan

The site is centered at National Grid Reference 419733^{E} 428697^{N} at a height of approximately 190m above Ordnance Datum.

A Site Location Plan is presented as Figure 1 and a Site Plan as Figure 2. A Geology Plan is presented as Figure 3 and a Blocking Coal Outcrop Plan as Figure 4.

Archival maps are presented in Appendix A, The Coal Authority Report is presented in Appendix B. Photographs of the site are presented as Appendix C.

2.2 Site History

The history of the site was assessed from archival maps dating 1852 to 2012. These are reproduced in Appendix A.

The OS 1852 map indicates the site as open land with several coal pits and coal and ironstone pits mentioned to the west, north and east of the site. The map of 1892 indicates the presence of Cross Pit a coal and ironstone pit immediately to the south of the site with a tramway running from the pit to the north west. The maps of 1893 indicate the site as open land with Cross Pit to the south. The map of 1906 indicates Cross Pit to have two access shafts and an air shaft.
A square annotated in the north of Cross Pit is annotated in 1922 as a reservoir. The 1932 to 1933 map indicates the pit as disused. By 1956 the colliery spoil appears to have been spread further north partly across the site with a football pitch to the north east and a pavilion to the north.

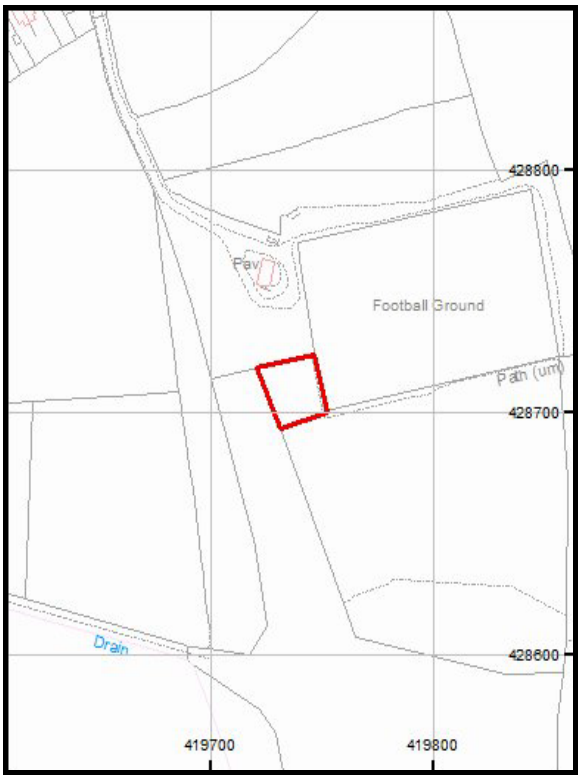


Figure 2 Site Plan

3. REPORT OBJECTIVE AND REPORT SCOPE

The objective of this Coal Mining Risk Assessment (CMRA) desk study is to examine the topographical, geological and mining data available for the site and determine the risk to the proposed development from past deep and shallow underground coal mining and disused mine shafts.

In addition to the above this study has used the extensive knowledge and experience of the staff of Ashton Bennett Consultancy to assess the data and to interpret the data findings.

4. SITE GEOLOGY

4.1 Geology

The published British Geological Survey (BGS) maps at a scale of 1:10,000 (SE22SE) show the site area to be underlain by colliery spoil overlying the sandstones, mudstones and interbedded coal seams of the Lower Coal Measures. The strata immediately beneath the site are shown to be spoil underlain by mudstone, the Fallhouse Rock Sandstone and the Blocking Coal.

A Geology Plan of the site and local borehole locations is presented as Figure 3.

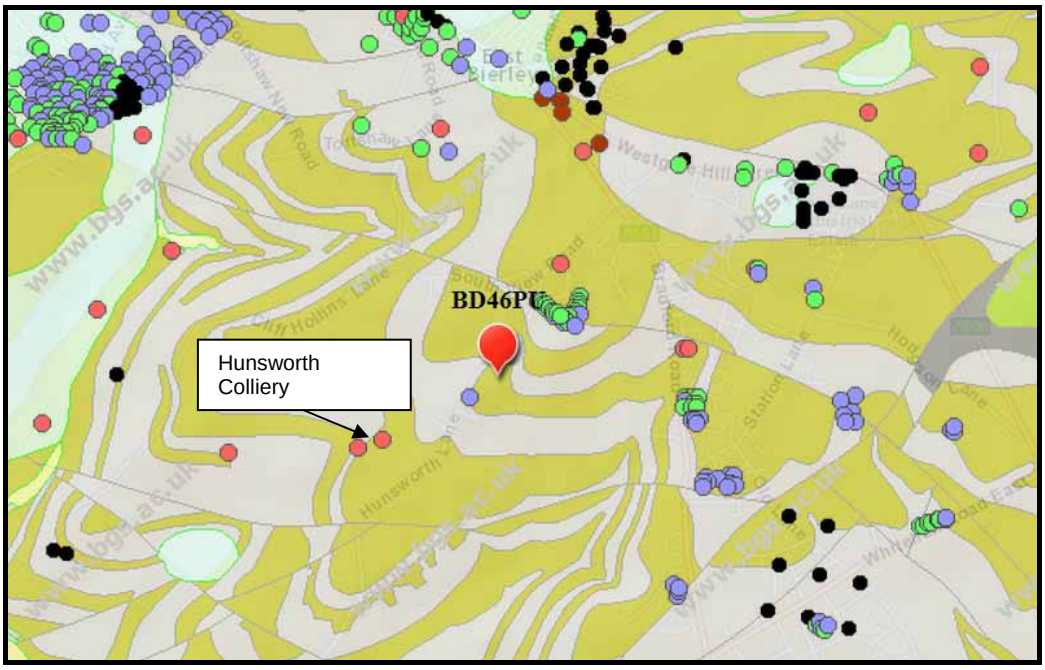


Figure 3 Geology Plan

The sequence of strata beneath the site to circa 30m bgl comprises:

Mudstone
Fallhouse Rock Sandstone
Blocking Rider Coal
Blocking Coal
Mudstone

Hunsworth Colliery sunk in the late 19th Century to the immediate west of the site confirms the geological sequence and depth of coal seams as shown in Section 5, Table 1. The coal seams are described further in Section 5.

4.2 Geological Faults

The geological maps do not indicate the presence of any recorded geological faults on or in close vicinity to the site. There are two faults shown circa 300m to the north and to the south of the site trending west to east and north west to south east respectively. The Coal Measures strata are heavily faulted from past tectonic activity and small unrecorded faults may also be present on the site.

The faults are unlikely to detrimentally affect the stability of the site unless shallow mined ground is present beneath the site.

5. MINING

5.1 The Coal Authority Report

The Mining Report obtained by the client from The Coal Authority for the site states that according to their records the property is in the likely physical influence from workings in 3 seams of coal at 80m to 180m depth and last worked in 1892. The Coal Authority state that any ground movement from these workings should have stopped by now. In addition the Coal Authority state that the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past before Coal Authority records commenced in 1872.

The property is not in the likely zone of influence of any present underground coal workings. The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods however, reserves of coal do exist in the local area which could be worked at some time in the future.

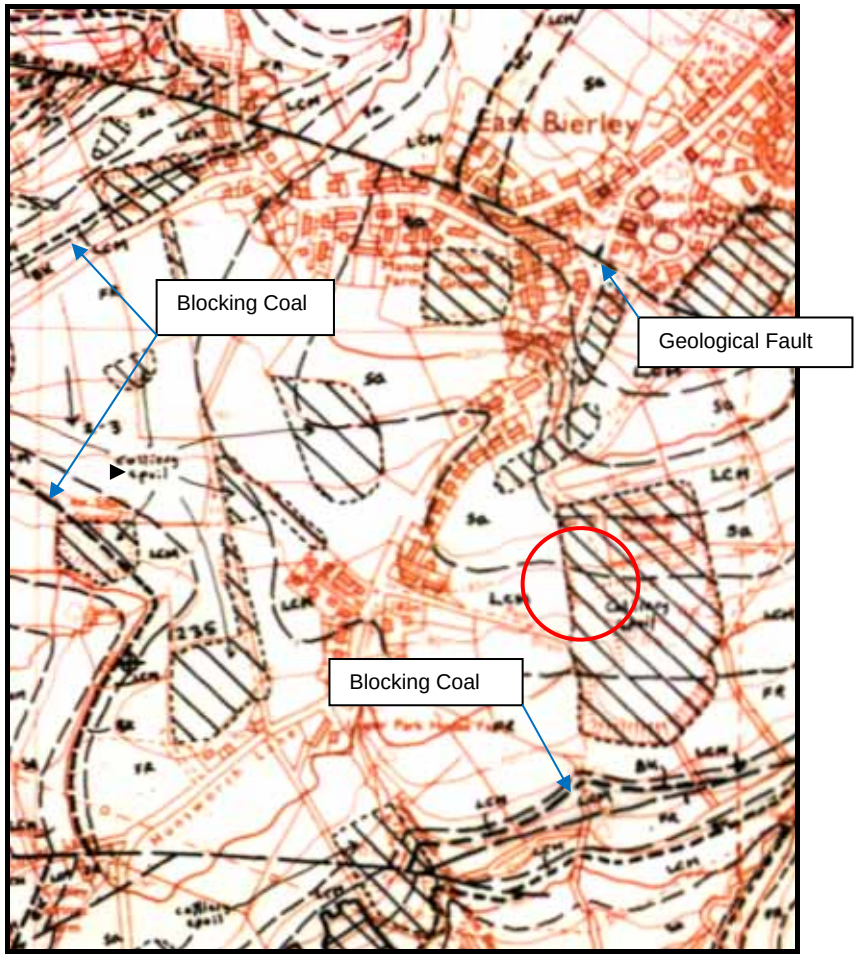


Figure 4 Blocking Coal Outcrop Plan

The Coal Authority is not aware of any evidence of damage due to geological faults or other lines of weakness that may have been affected by coal mining. The property is not within the boundary of an opencast site from which coal has been removed by opencast methods. The property does not lie within 200m of the boundary of an opencast site from which coal is being removed by opencast methods. The property is not within 800m of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods. The property is not within 800m of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50m, since October 1994. There is no current stop notice delaying the start of remedial works or repairs to the property. The Authority is not aware of any request having been made to carry out preventative works before coal is worked under Section 33 of the Coal Mining Subsidence Act 1991.

There is no record of any mine gas emissions requiring action by the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Within or within 20m of the boundary of the property there are no recorded mine entries. However records are not complete and circular features should also be investigated further.

The Coal Authority Report is presented in Appendix B and should be read in full.

5.2 Deep Coal Mining

The coal seams recorded as mined beneath the site are the Whinmoor at 80m, the Black Bed at 150m and the Better Bed at 180m bgl. These mined seams lie at a depth where there is sufficient cover of competent strata to prevent any voids remaining in the workings from migrating by successive roof collapse and causing ground settlement in the future. **The risk to the site from deep mining is a low risk.**

5.3 Shallow Coal Mining

The Coal Authority Report states that shallow mining may have occurred beneath the site as they believe coal seams may be present at or near the ground surface. The Coal Authority records only date from 1872 and as shallow mining often occurred before that date, there are often no records of the early mined coal seams. The coal seams present at shallow (<30m bgl) depth beneath the site are shown in Table 1 with the probability of the each seam being worked.

The Blocking Rider and Blocking Coal seams are good quality coals and both seams were extensively worked by mining and opencast methods in and around East Bierley.

If one, or both of the seams, are mined and if voids remain in these mined seams and if insufficient competent strata lies above the voids, then the voids may migrate by successive roof collapse over the years producing subsidence at ground level.

If sufficient thickness of competent strata overlies voids then the voids may become choked before they reach the ground surface.

As there are two coal seams within the upper 30m bgl beneath the site and as cavities have been detected in boreholes within the local area, there is a **medium to high risk that the site may be undermined at shallow depth.** If the site is undermined there may be sufficient overlying competent strata to prevent voids migrating to the surface. This will depend on the depth of the coal seams and which seams, if any, have been mined. Alternatively there may be insufficient cover and ground stabilisation may be required.

TABLE 1
Estimated Depth of Coal Seams beneath Site

Strata	Thickness in m	Depth bgl in m	Worked on site	Worked in vicinity of site
Mudstone				
Sandstone	6 to 12			
Blocking Rider Coal	0.20	15	Possibly	Yes
Blocking Coal	0.50-0.80	20	Possibly	Yes
Mudstone				
Lousey Coal	0.40-0.80	40	Unlikely	
Trub Coal	0.00-0.50	55		
Churwell Coal	0.00-0.50	65		Yes
Shertcliffe Coal	0.40-0.80	80	YES	Yes
Clifton Rock	8 to 30			
32 Yard Coal	0.00-0.30	120	Possibly	Yes
22 Yard Coal	0.10-0.40			
Crow Coal	0.00-0.70	140		
Black Bed Coal **Black Bed Ironstone**	0.80-1.80	150	YES YES	Yes Yes
Thick Stone Sandstone	12 to17			
Better Bed Coal	0.30-0.90	180	YES	Yes
Grenoside Sandstone	5 to 16			

Note. There are additional mudstone and sandstone sequences not shown.

5.4 Mine Shafts

The Coal Authority Report states that the Coal Authority have no records of a mine shaft within or within 20m of the site boundary. The Coal Authority records are incomplete and any circular features detected on site should always be assessed by an engineer in case they represent an unstable mine shaft.

Based on the records of a large area of Colliery spoil on the site and surrounding area and the shallow depth to coal, there is a risk of a mine shaft being on or within close vicinity to the site.

6. RISK ASSESSMENT

The Coal Mining Risk Assessment undertaken has indicated that the site is underlain by the Lower Coal Measures comprising mudstones, sandstones and interbedded coal seams. Based on the BGS geological maps and records of boreholes drilled in the area, the site is expected to be underlain by mudstone in turn underlain by sandstones with two shallow interbedded coal seams and further sandstones and mudstones with interbedded coal seams.

The shallowest coal seams the Blocking Rider and Blocking Coal have been mined extensively in the area. If mined, the coal seams are likely to contain voids and there may be insufficient strata overlying the coal seams to prevent voids migrating by successive roof collapse and causing ground settlement and structural damage to the overlying development in the future. Records of boreholes sunk to the immediate north east of the site indicate the presence of backfill representing workings in several boreholes.

The **shallow coal** (Blocking Rider and Blocking Coals) workings therefore pose a **medium to high risk** to future development.

The records from the Coal Authority indicate 3 seams of coal have been recorded as mined at depths of 80m to 180m bgl. Any subsidence from these should be complete if they were mined by longwall method which lets down the ground surface as mining proceeds. If voids remain in any pillar and stall workings in the deep coal seams (>30m bgl) it is unlikely they will migrate to the surface and cause ground subsidence due to the thickness of competent strata comprising overlying the workings.

The risk of the site being detrimentally affected by workings in **coal at depth** (>30m bgl) is a **low risk**.

The risk that collapse of underground workings could cause subsidence at the ground surface above is normally empirically assessed using the T10 rule (developed by the National Coal Board in 1973 and based on experience) whereby if a thickness of 10 x the worked seam thickness of competent cover (i.e. rock) is present over the worked seam then it is deemed sufficient to be able to choke the voided ground without giving rise to surface settlement.

Given the expected shallow depth of the Blocking Rider and Blocking Coal seams and expected thickness of the seams and the extensive workings of the seams in the locality, it is considered **a medium to high risk** that the proposed development could be affected by past underground unrecorded shallow coal mining.

There are no recorded mine shafts on the site and the 1850 does not indicate any mine shafts or disused mine shafts on the site or within 20m of the site. The risk of a disused mine shaft detrimentally affecting the site is considered a **low risk**.

7. CONCLUSIONS AND RECOMMENDATIONS

The evidence gathered in this coal mining risk assessment report suggests that there is a **medium to high risk** to the proposed development from shallow coal mining causing ground subsidence in the future. It is thus recommended that the footprint of the proposed development is proof drilled to investigate the ground sequence down to a depth of 30m prior to any construction taking place. It is recommended that the proposed investigation follows the following course:

- Initially, two boreholes taken down to prove at least 30m of competent strata bedrock to confirm the ground conditions and assess the presence of any voids in the ground and the thickness of any competent cover above the voids.
- If the coal seams are not mined, or if sufficient competent strata overlies any voids to prevent then causing ground settlement, then ground stabilisation will not be required and founding strata can be determined.
- If insufficient competent cover is found over any mined coal seams then additional boreholes will be required over the footprint of the structure to confirm the extent of workings (on the basis that the boreholes striking coal could have struck a pillar).
- If underground workings are proved and there is insufficient competent cover then ground treatment is likely to be required prior to proceeding with construction to stabilise the ground and further consideration will be required for foundation design.

Ashton Bennett would be able to design, tender, procure and supervise the proposed drilling works together with any follow-on ground treatment work that may be necessary and provide an updated risk assessment report for issue to the regulatory authorities as required. Ashton Bennett will acquire the necessary Coal Authority Permits required to drill through the coal.

Due to the possible presence of worked ground at the site, it will be necessary to confirm a suitable founding stratum for the proposed structure. Any investigations for mining risk assessment purposes could be designed to provide the necessary information for foundation design.

8. GENERAL REMARKS

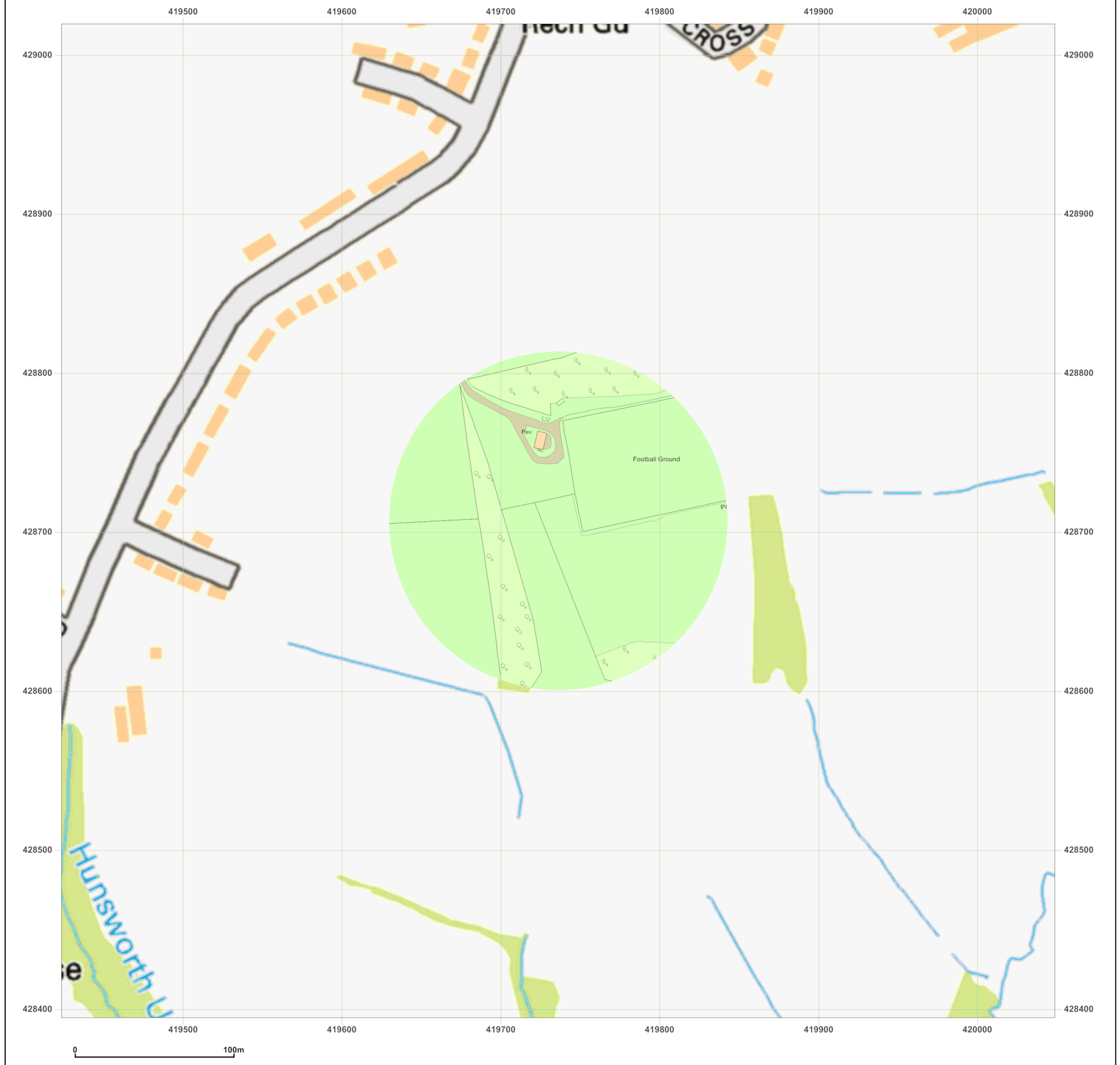
This report truly reflects the conditions found during the coal mining risk assessment study. Whilst the mining risk assessment was undertaken in a professional manner taking due regard of additional information which became available as a result of ongoing research, the results portrayed only pertain to the information attained and the ground and mining conditions expected. It is possible that other undetected information, undetected ground conditions and undetected mining conditions may exist. The mining risk assessment was only undertaken within the site boundaries and should not be used for interpretation purposes elsewhere. The conclusions are only a brief summary of the report, and it is recommended that the report is read in full to ensure that all recommendations have been understood.

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Frances A Bennett
BSc, CGeol, FGS, FIMMM, CEnv, MCIWEM, AIEMA, MIEnvSci.

Appendix **A**





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Historical Mapping Extract

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Site Details:

EAST BRIERLEY PLAYING FIELDS

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Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

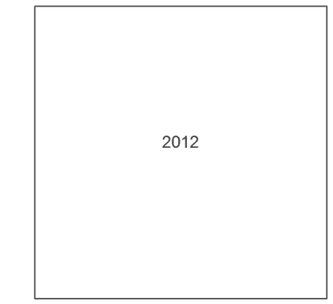
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Map date: **2012**

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Site Details:

EAST BRIERLEY PLAYING FIELDS

Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

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Revised N/A
Edition N/A
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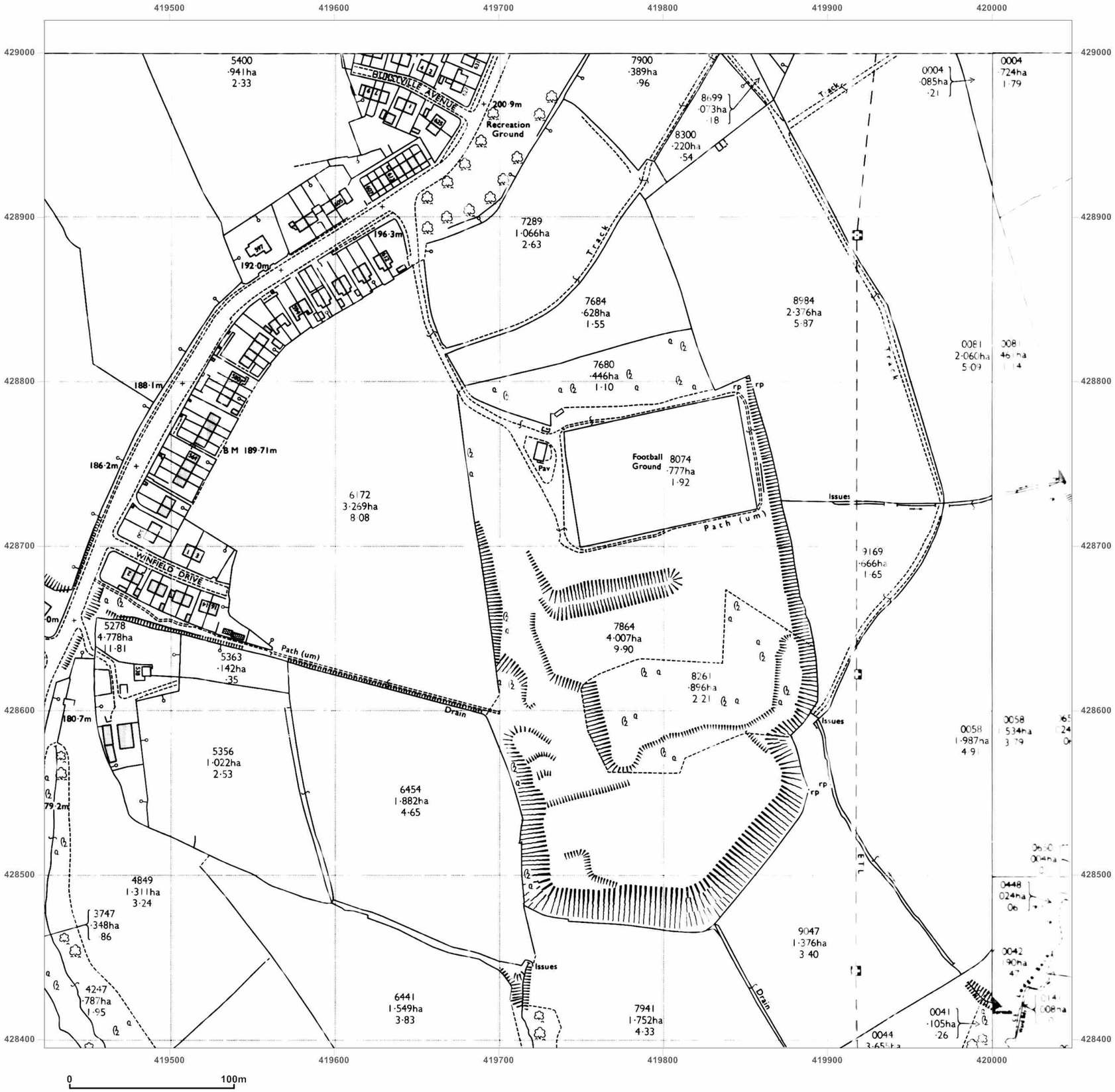
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Site Details:

EAST BRIERLEY PLAYING FIELDS

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Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1973-1977**

Scale: 1:2,500

Printed at: 1:2,500

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Levelled N/A

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Map Name: National Grid

Map date: **1971-1975**

Scale: 1:2,500

Printed at: 1:2,500

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Site Details:

EAST BRIERLEY PLAYING FIELDS

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Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1956**

Scale: 1:2,500

Printed at: 1:2,500

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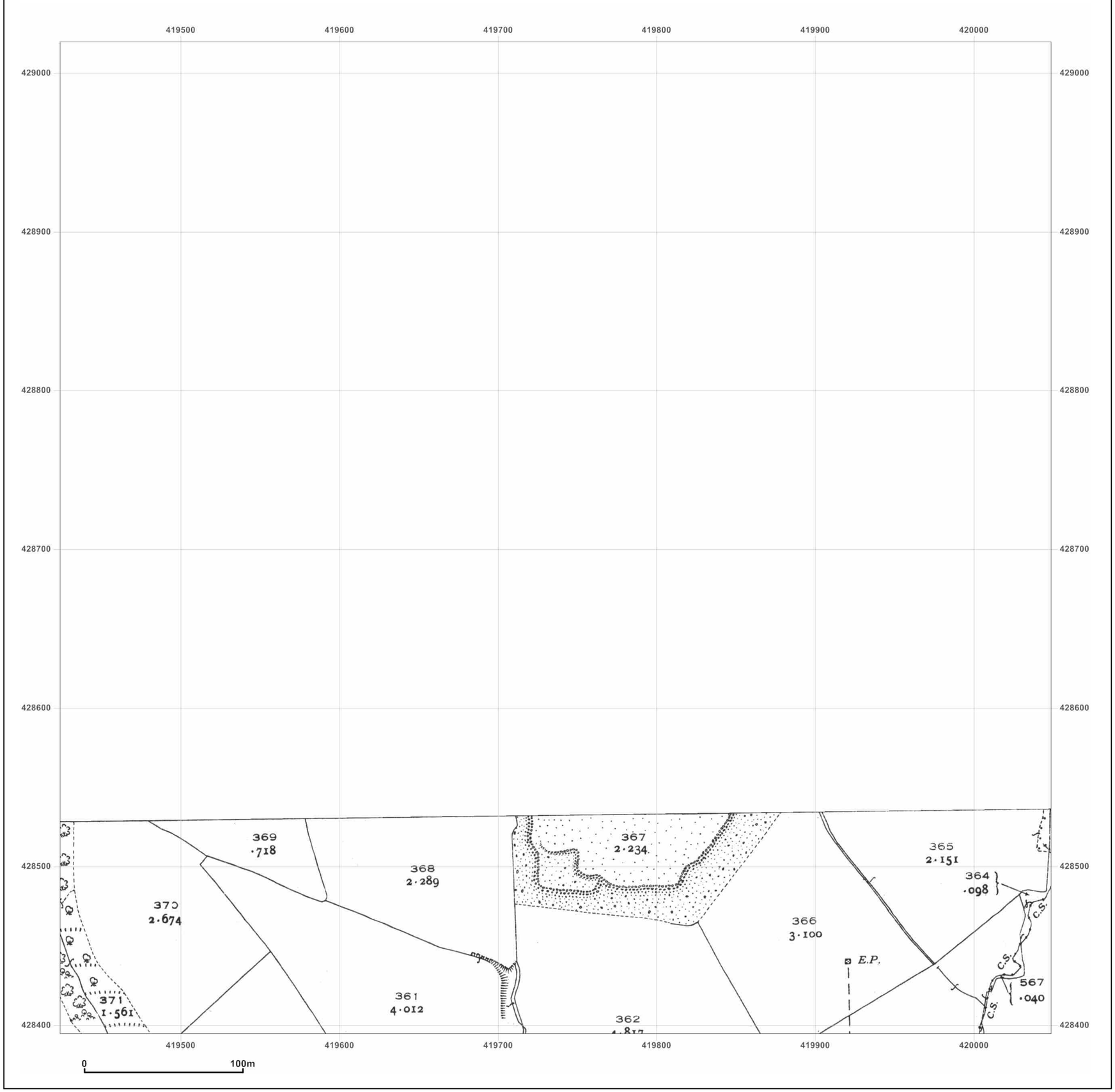
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Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

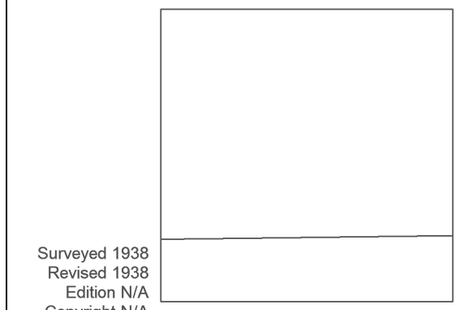
Map Name: County Series

Map date: **1938**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1938
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

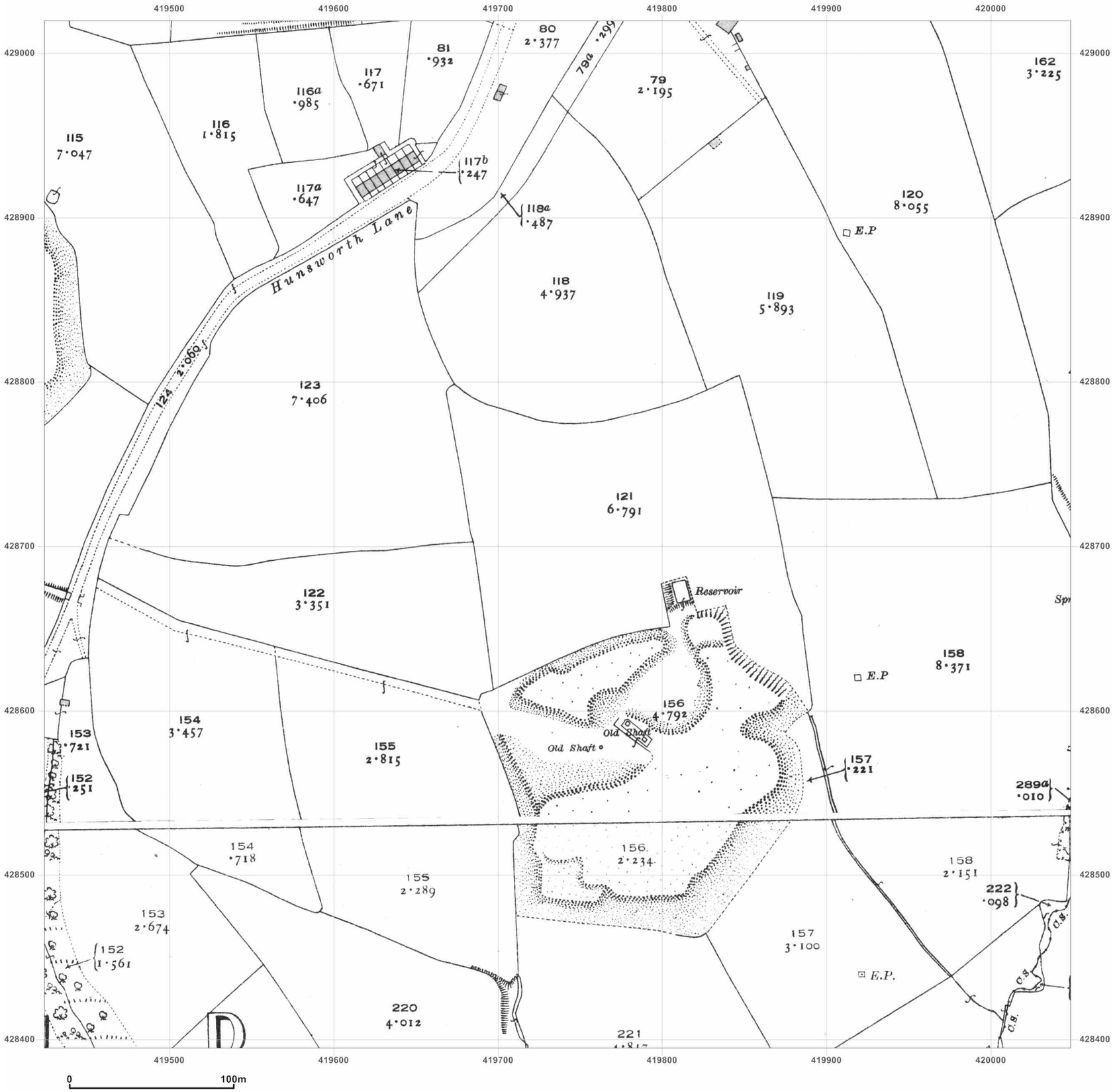
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Grid Ref: 419736, 428707

Map Name: County Series

Map date: **1932-1933**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1933
Revised 1933
Edition N/A
Copyright N/A
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Grid Ref: 419736, 428707

Map Name: County Series

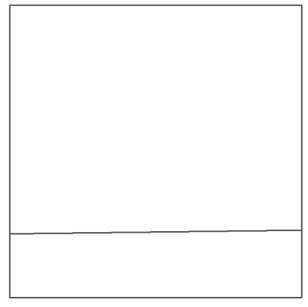
Map date: **1922**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1922
Revised 1922
Edition N/A
Copyright N/A
Levelled N/A



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Grid Ref: 419736, 428707

Map Name: County Series

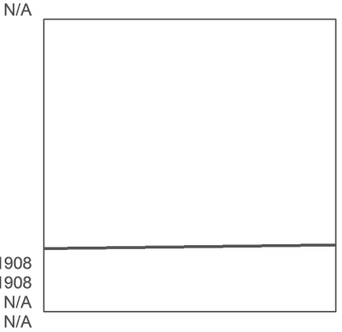
Map date: **1908**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1908
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1908
Revised 1908
Edition N/A
Copyright N/A
Levelled N/A

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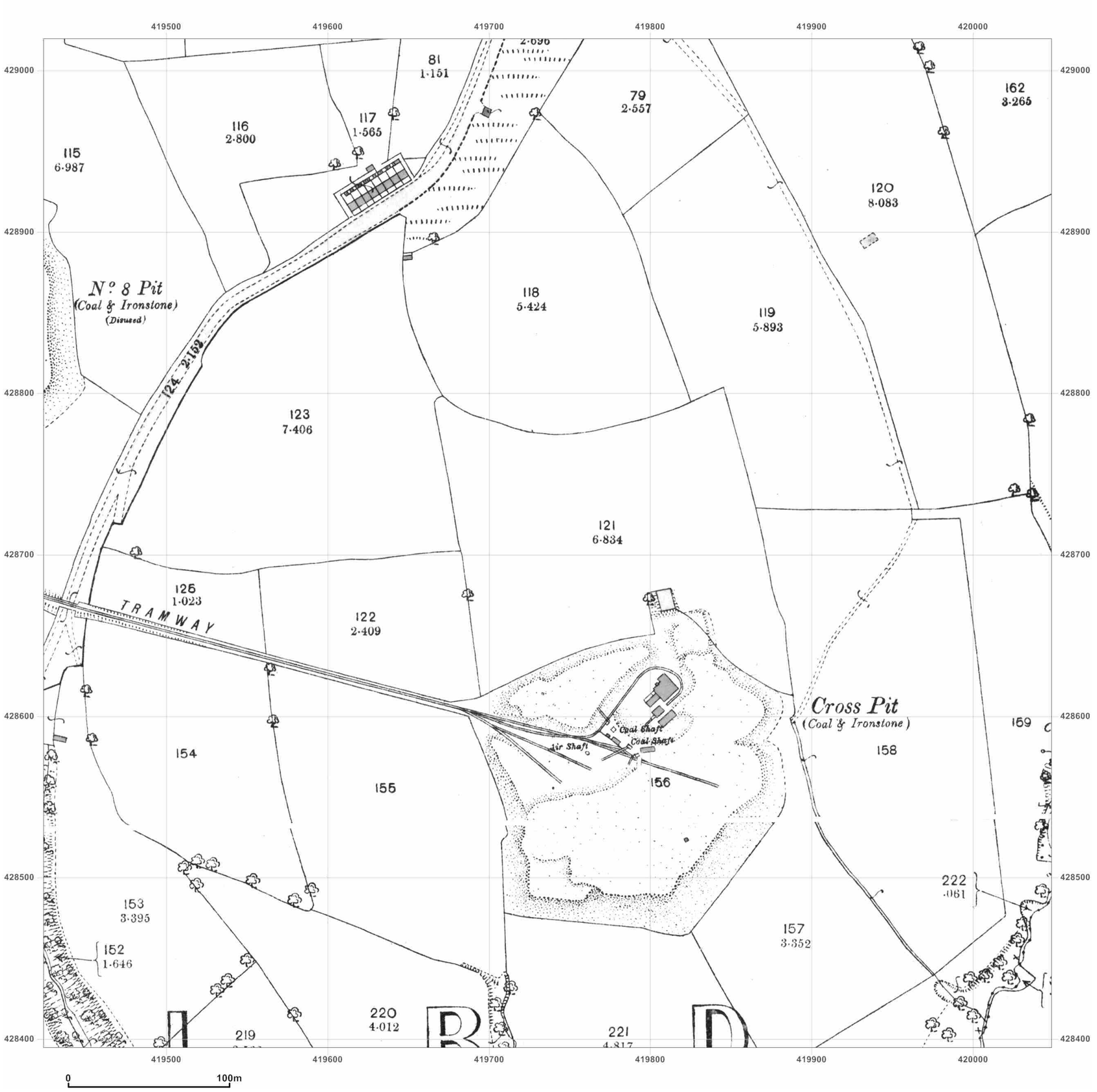
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Grid Ref: 419736, 428707

Map Name: County Series

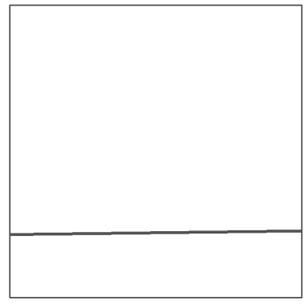
Map date: **1893**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1893
Revised 1893
Edition N/A
Copyright N/A
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Surveyed 1893
Revised 1893
Edition N/A
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Site Details:

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Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **2012**

Scale: 1:10,000

Printed at: 1:10,000

N W E S

2012

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Client Ref: 4873
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Grid Ref: 419736, 428707

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

N W E S

2002

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Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1990-1994**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1987
Revised 1990
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1994
Edition N/A
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Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1983-1985**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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Surveyed 1982
Revised 1983
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

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Grid Ref: 419736, 428707

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1974
Edition N/A
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Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: Provisional

Map date: **1965-1967**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed 1966
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
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Grid Ref: 419736, 428707

Map Name: Provisional

Map date: **1954-1955**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed N/A Revised 1955 Edition N/A Copyright N/A Levelled N/A	Surveyed 1954 Revised 1954 Edition N/A Copyright N/A Levelled N/A
Surveyed N/A Revised 1955 Edition N/A Copyright N/A Levelled N/A	Surveyed 1951 Revised 1951 Edition N/A Copyright 1955 Levelled N/A

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Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1850
Revised 1948
Edition 1948
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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EAST BRIERLEY PLAYING FIELDS

Client Ref: 4873
Report Ref: CMAPS-CM-310742-4873-270314HIS
Grid Ref: 419736, 428707

Map Name: County Series

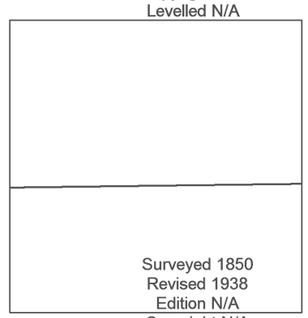
Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1850
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1850
Revised 1938
Edition N/A
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Grid Ref: 419736, 428707

Map Name: County Series

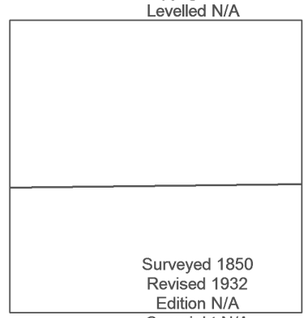
Map date: **1932**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1850
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1850
Revised 1932
Edition N/A
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Grid Ref: 419736, 428707

Map Name: County Series

Map date: **1905**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1892
Revised 1905
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1889
Revised 1905
Edition N/A
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Grid Ref: 419736, 428707

Map Name: County Series

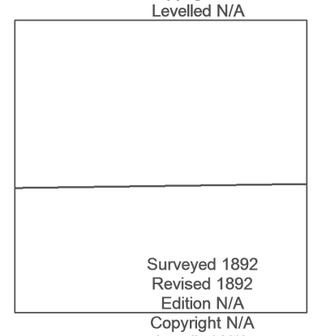
Map date: **1892**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1892
Revised 1892
Edition N/A
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Grid Ref: 419736, 428707

Map Name: County Series

Map date: **1852-1854**

Scale: 1:10,560

Printed at: 1:10,560

N W E S

Surveyed 1847
Revised N/A
Edition 1852
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Appendix **B**



The Coal Authority

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ASHTON BENNETT CONSULTANCY
UNIT K BRIDGE MILLS
HOLMFIRTH
WEST YORKSHIRE
HD9 3TW

Our reference:	**51000483494001**
Your reference:	**3147**
Date of your enquiry:	**27 February 2014**
Date we received your enquiry:	**27 February 2014**
Date of issue:	**27 February 2014**

This report is for the property described in the address below and the attached plan.

Non-Residential Coal Authority Mining Report

BD4 6PU

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at 80m to 180m depth, and last worked in 1892.

Any ground movement from these coal workings should have stopped by now.

In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

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However, reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast coal mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working facilities orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to owners of former copyhold land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

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Comments on Coal Authority information

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional Remarks

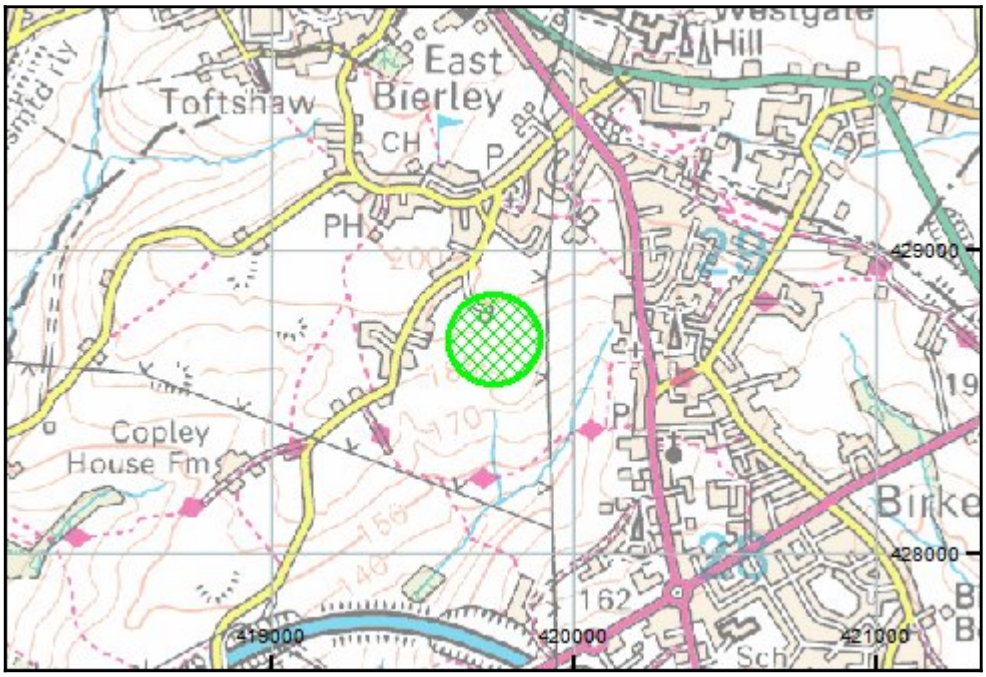
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Tax Point Date:	27 February 2014
Issued to:	ASHTON BENNETT CONSULTANCY UNIT K BRIDGE MILLS HOLMFIRTH WEST YORKSHIRE HD9 3TW
Property Search for:	BD4 6PU
Reference Number:	51000483494001
Date of Issue:	27 February 2014
Cost:	£59.00
VAT @ 20%:	£11.80
Total Received:	£70.80
VAT Registration	598 5850 68

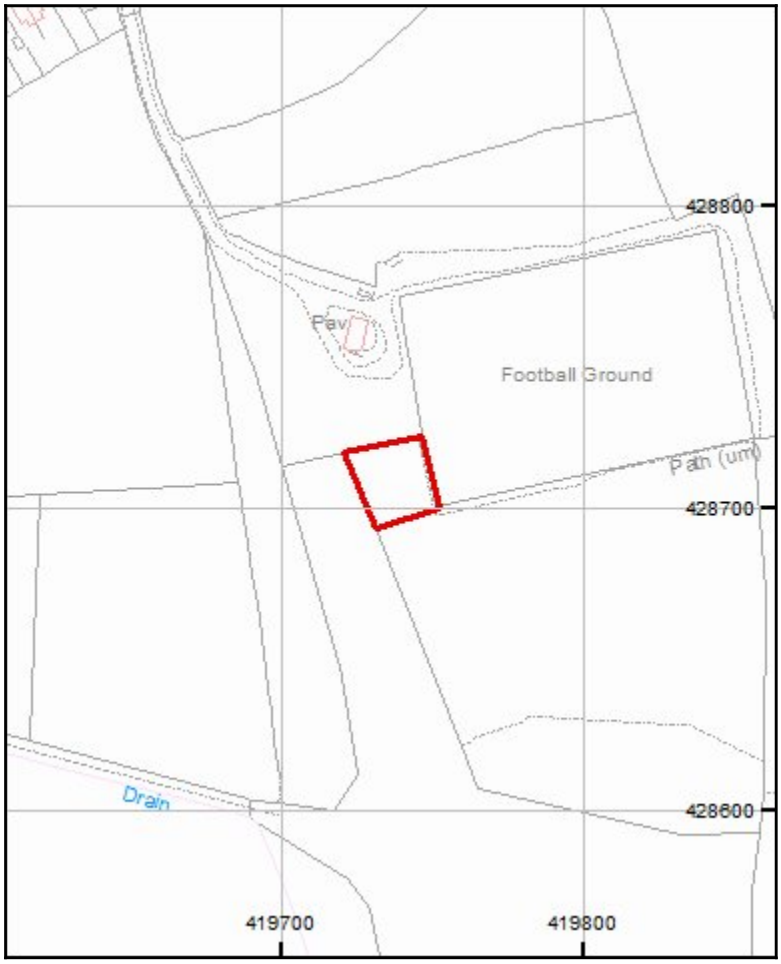
Location map

Approximate position of property



Enquiry boundary

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Key

Approximate position of enquiry boundary shown

Mapping sourced from Ordnance Survey

Appendix C



PHOTOGRAPHS





View north east over site area form the south





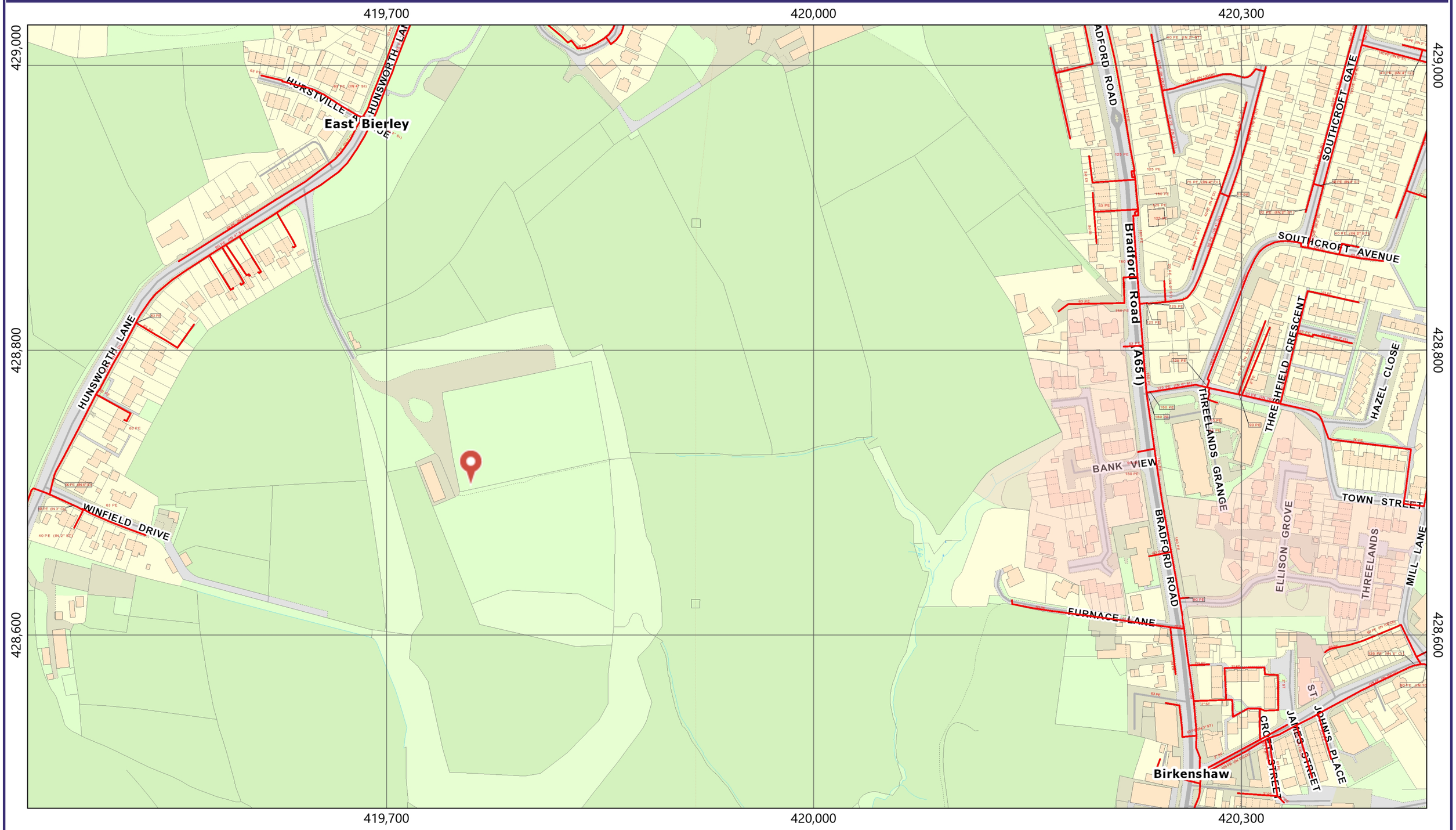
View of the northern area of site behind the containers





Appendix B Statutory Undertakers Responses

419759, 428717



Legend

Pipes
- Intermediate Pressure
- Medium Pressure
- Low Pressure

Transmission Pipe
- Regional High Pressure

Asset Protection
- Cathodic
- Slabbed
- Sleeved

Network Plant
- Flow Stop - Open
- Flow Stop - Closed
- Valve - Open
- Valve - Closed
- Transmission Valve - Open
- Transmission Valve - Closed

Network Asset
- CP Point
- Dip Point
- Drain Point
- End Closure
- Flow Measure
- Gas Conditioner
- Governor
- MEG Point
- Meter
- OMR
- Oiling Point

Network Asset (continued)
- Pig Trap
- Pipe Joint
- Pressure Measurement
- Purge Point
- Reducer
- Stand Pipe
- Syphon
- Tee
- Test Point

Non-Network Asset
- Outlet
- Inlet
- Depth of Cover
- Crossover Connection
- Change in Material
- Change in Diameter

- NTS

IGT Area
- IGT Site
- Infill Site
- LPG Site
- OMR's

Pipeline
- Contact Zone

Environment
- SAM
- SSSI

1: 2,500

0 — 75

Meters

Disclaimer Information

This plan shows those pipes owned by Northern Gas Networks or the relevant Gas Distribution Network in their roles as Licensed Gas Transporters (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Northern Gas Networks, the relevant Gas Distribution Network, or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

This plan is reproduced or based on the OS map by Northern Gas Networks, with the sanction of the controller of HM Stationary Office. Crown Copyright Reserved.

User ID	Donna Casey
Date	18/05/2022
Grid Ref	419939 / 428753

Northern Gas Networks

Advanced Plot

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45o and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below)*. Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

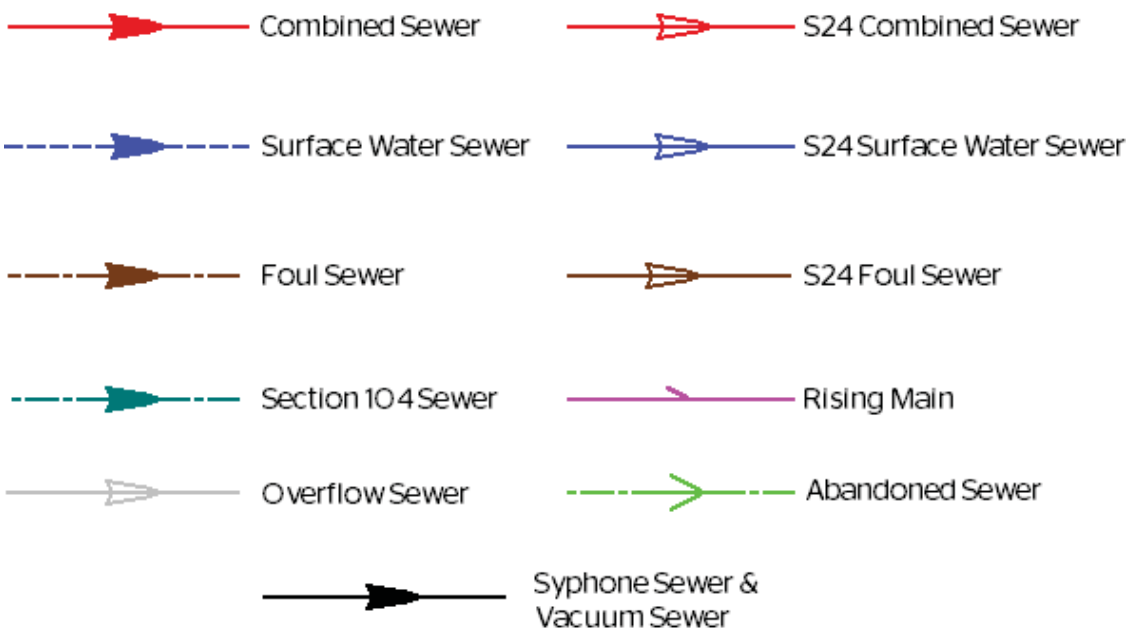
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20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

Property Identfier

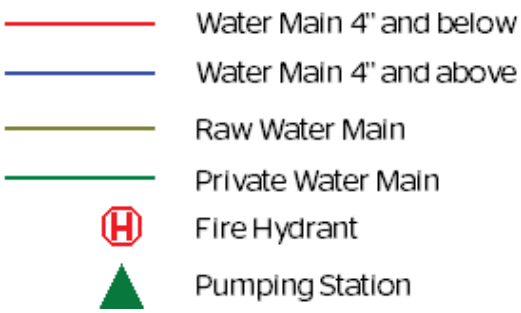


Sewer Legend



Please note that the direction of flow arrows may not always appear depending on the scale of the map.

Water Legend



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Public Clean Water Network 18/05/2022 15:05:58 OS Grid Coordinates: 419636 : 428579 Map Name : SE1928NE svcGISSafeMovePD

Registered office, Yorkshire water Services Limited. 1
Western House, Halifax Road, Bradford BD62SZ.
Registered in England and wales No. 2366682

SafeMove
A part of YorkshireWater

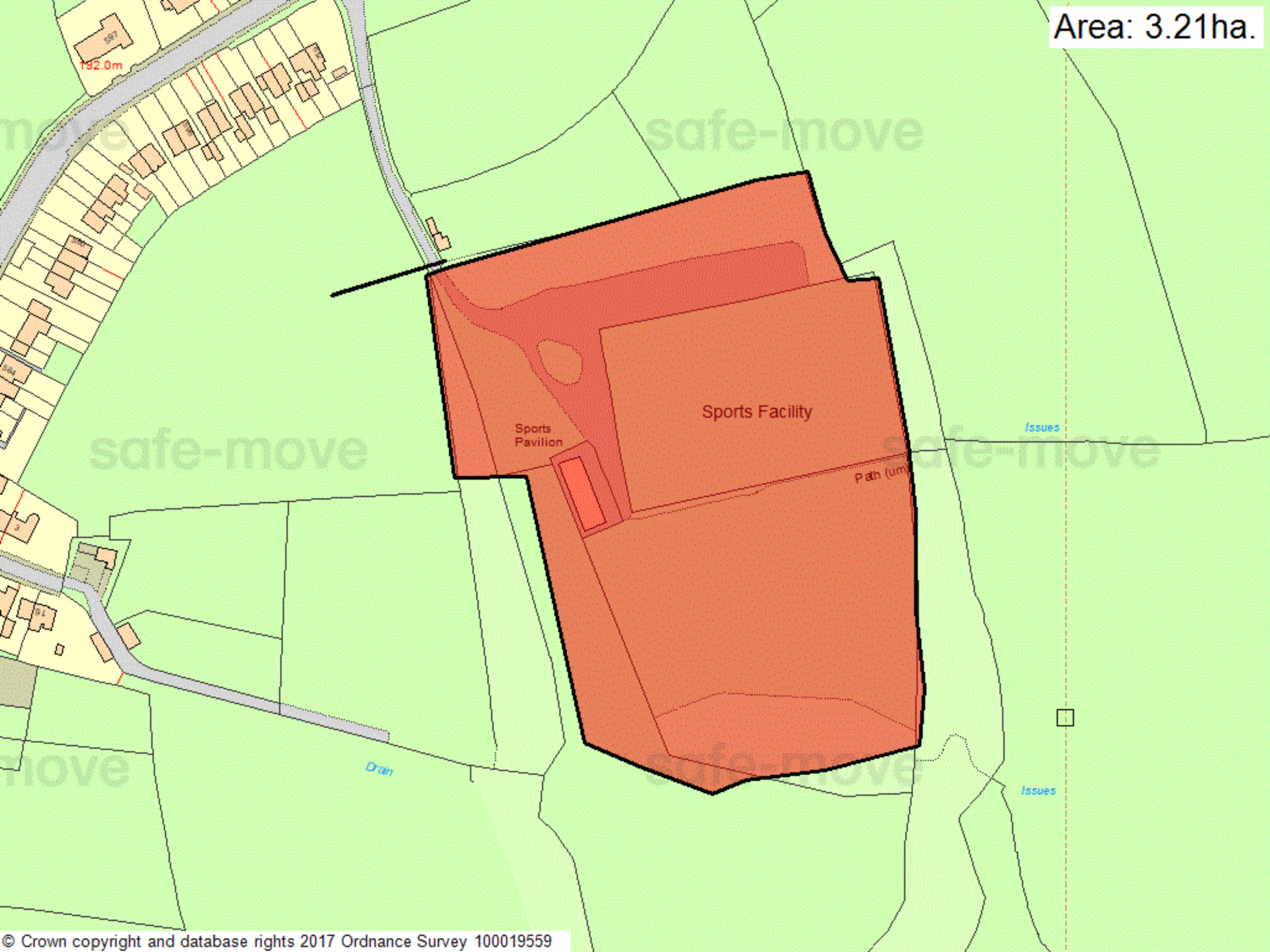
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Public Waste Water Network 18/05/2022 15:05:59 OS Grid Coordinates: 419636 : 428579 Map Name : SE1928NE svcGISSafeMovePD

Registered office, Yorkshire water Services Limited. 1
Western House, Halifax Road, Bradford BD62SZ.
Registered in England and wales No. 2366682

SafeMove
A part of YorkshireWater



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Enquiry Confirmation

LSBUD Ref: 25680320

Date of enquiry: 18/05/2022
Time of enquiry: 14:24

Enquirer

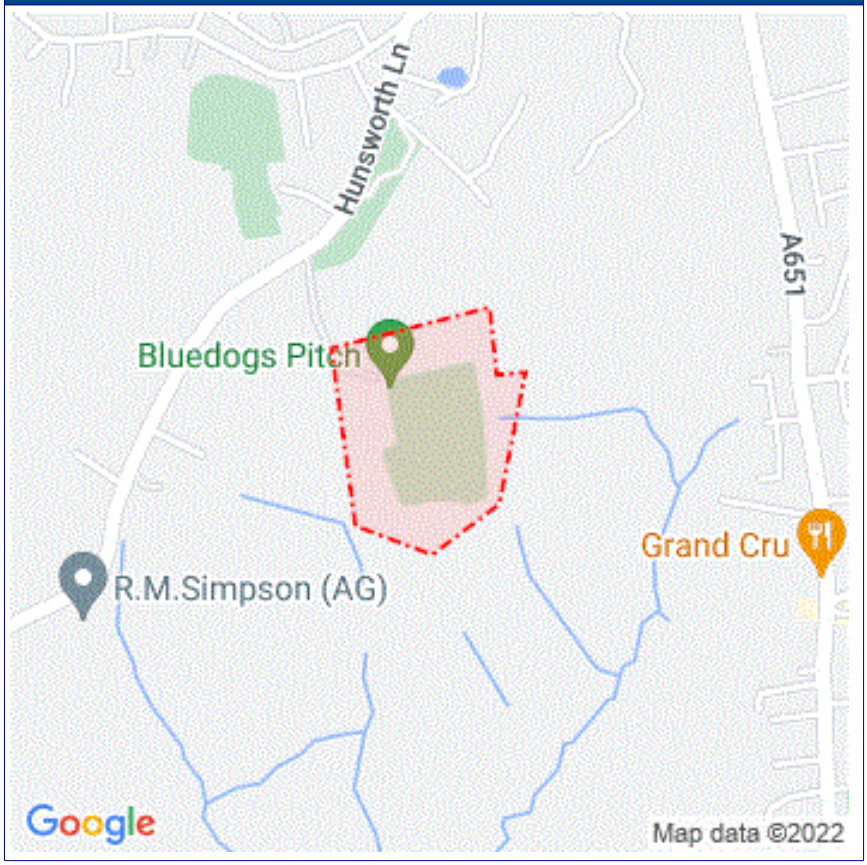
Name	Mrs Karen Villiers	Phone	01604 781877
Company	Soiltechnics Limited	Mobile	Not Supplied
Address	Soiltechnics Limited Cedar Barn White Lodge Walgrave Northamptonshire NN6 9PY		
Email	karen.villiers@soiltechnics.net		

Enquiry Details

Scheme/Reference	STU5725		
Enquiry type	Planned Works	Work category	Development Projects
Start date	19/05/2022	Work type	Commercial/industrial
End date	20/05/2022	Site size	47314 metres square
Searched location	XY= 419759, 428717	Work type buffer*	75 metres
Confirmed location	-02 54		
Site Contact Name	Not Supplied	Site Phone No	Not Supplied
Description of Works			

* The WORK TYPE BUFFER is a distance added to your search area based on the Work type you have chosen.

Site Map



Enquiry Confirmation

LSBUD Ref: 25680320

Date of enquiry: 18/05/2022
Time of enquiry: 14:24

Asset Owners

Terms and Conditions. Please note that this enquiry is subject always to our standard terms and conditions available at www.linesearchbeforeudig.co.uk ("Terms of Use") and the disclaimer at the end of this document. Please note that in the event of any conflict or ambiguity between the terms of this Enquiry Confirmation and the Terms of Use, the Terms of Use shall take precedence.

Notes. Please ensure your contact details are correct and up to date on the system in case the LSBUD Members need to contact you.

Validity and search criteria. The results of this enquiry are based on the confirmed information you entered and are valid only as at the date of the enquiry. It is your responsibility to ensure that the Enquiry Details are correct, and LinesearchbeforeUdig accepts no responsibility for any errors or omissions in the Enquiry Details or any consequences thereof. LSBUD Members update their asset information on a regular basis so you are advised to consider this when undertaking any works. It is your responsibility to choose the period of time after which you need to resubmit any enquiry but the maximum time (after which your enquiry will no longer be dealt with by the LSBUD Helpdesk and LSBUD Members) is 28 days. If any details of the enquiry change, particularly including, but not limited to, the location of the work, then a further enquiry must be made.

Asset Owners & Responses. Please note the enquiry results include the following:

1. "LSBUD Members" who are asset owners who have registered their assets on the LSBUD service.
2. "Non LSBUD Members" are asset owners who have not registered their assets on the LSBUD service but LSBUD is aware of their existence. Please note that there could be other asset owners within your search area.

Below are three lists of asset owners:

1. LSBUD Members who have assets registered within your search area. ("Affected")
   a. These LSBUD Members will either:
      i. Ask for further information ("Email Additional Info" noted in status). The additional information includes: Site contact name and number, Location plan, Detailed plan (minimum scale 1:2500), Cross sectional drawings (if available), Work Specification.

      ii. Respond directly to you ("Await Response"). In this response they may either send plans directly to you or ask for further information before being able to do so, particularly if any payments or authorisations are required.

2. LSBUD Members who do not have assets registered within your search area. ("Not Affected")

3. Non LSBUD Members who may have assets within your search area. Please note that this list is not exhaustive and all details are provided as a guide only. It is your responsibility to identify and consult with all asset owners before proceeding.

Enquiry Confirmation

LSBUD Ref: 25680320

Date of enquiry: 18/05/2022
Time of enquiry: 14:24

LSBUD Members who have assets registered on the LSBUD service within the vicinity of your search area.

List of affected LSBUD members
No LinesearchbeforeUdig Asset Owners within the Zone of Interest

LSBUD Members who do not have assets registered on the LSBUD service within the vicinity of your search area. Please be aware that LSBUD Members make regular changes to their assets and this list may vary for new enquiries in the same area.

List of not affected LSBUD members		
Angus Energy	AWE Pipeline	Balfour Beatty Investments Limited
BOC Limited (A Member of the Linde Group)	Box Broadband	BP Exploration Operating Company Limited
BPA	Cadent Gas	Carrington Gas Pipeline
CATS Pipeline c/o Wood Group PSN	Cemex	Centrica Storage Ltd
CNG Services Ltd	Concept Solutions People Ltd	ConocoPhillips (UK) Teesside Operator Ltd
D.S.Smith	Diamond Transmission Corporation	DIO (MOD Abandoned Pipelines)
DIO (MOD Live Pipelines)	E.ON UK CHP Limited	EirGrid
Electricity North West Limited	Energy Assets Pipelines	ENI & Himor c/o Penspen Ltd
EnQuest NNS Limited	EP Langage Limited	ESP Utilities Group
ESSAR	Esso Petroleum Company Limited	euNetworks Fiber UK Ltd
EXA Infrastructure	Exolum Pipeline System	Fulcrum Electricity Assets Limited
Fulcrum Pipelines Limited	Gamma	Gas Networks Ireland (UK)
Gateshead Energy Company	Gigaclear Ltd	Harbour Energy
Heathrow Airport LTD	Humbly Grove Energy	IGas Energy
INEOS FPS Pipelines	INEOS Manufacturing (Scotland and TSEP)	INOVYN ChlorVinyls Limited
INOVYN Enterprises Limited	Intergen (Coryton Energy or Spalding Energy)	Jurassic Fibre Ltd
Last Mile	Mainline Pipelines Limited	Manchester Jetline Limited
Manx Cable Company	Marchwood Power Ltd (Gas Pipeline)	Melbourn Solar Limited
Murphy Utility Assets	National Grid Electricity Transmission	National Grid Gas Transmission
Neos Networks	Northumbrian Water Group	NPower CHP Pipelines
NTT Global Data Centers EMEA UK Ltd	NYnet Ltd	Oikos Storage Limited
Ørsted	Palm Paper Ltd	Perenco UK Limited (Purbeck Southampton Pipeline)
Petroineos	Phillips 66	Portsmouth Water
Premier Transmission Ltd (SNIP)	Redundant Pipelines - LPDA	RWE - Great Yarmouth Pipeline (Bacton to Great Yarmouth Power Station)
RWEnpower (Little Barford and South Haven)	SABIC UK Petrochemicals	SAS Utility Services Ltd
Scottish and Southern Electricity Networks	Scottish Power Generation	Seabank Power Ltd
SES Water	SGN	Shell
Shell NOP	SP Energy Networks	Squire Energy Networks
SSE Generation Ltd	SSE Transmission	SSE Utility Solutions Limited
Tata Communications (c/o JSM Construction	Total Colnbrook Pipelines	Total Finaline Pipelines

Ltd)		
Transmission Capital	UK Power Networks	Uniper UK Ltd
University of Cambridge Granta Backbone Network	Vattenfall	Veolia ES SELCHP Limited
Veolia ES Sheffield Ltd	Voneus Limited	VPI Power Limited
Wales and West Utilities	West of Duddon Sands Transmission Ltd	Western Power Distribution
Westminster City Council	Zayo Group UK Ltd c/o JSM Group Ltd	

Enquiry Confirmation

LSBUD Ref: 25680320

Date of enquiry: 18/05/2022
Time of enquiry: 14:24

The following Non-LSBUD Members may have assets in your search area. It is YOUR RESPONSIBILITY to contact them before proceeding. Please be aware this list is not exhaustive and it is your responsibility to identify and contact all asset owners within your search area.

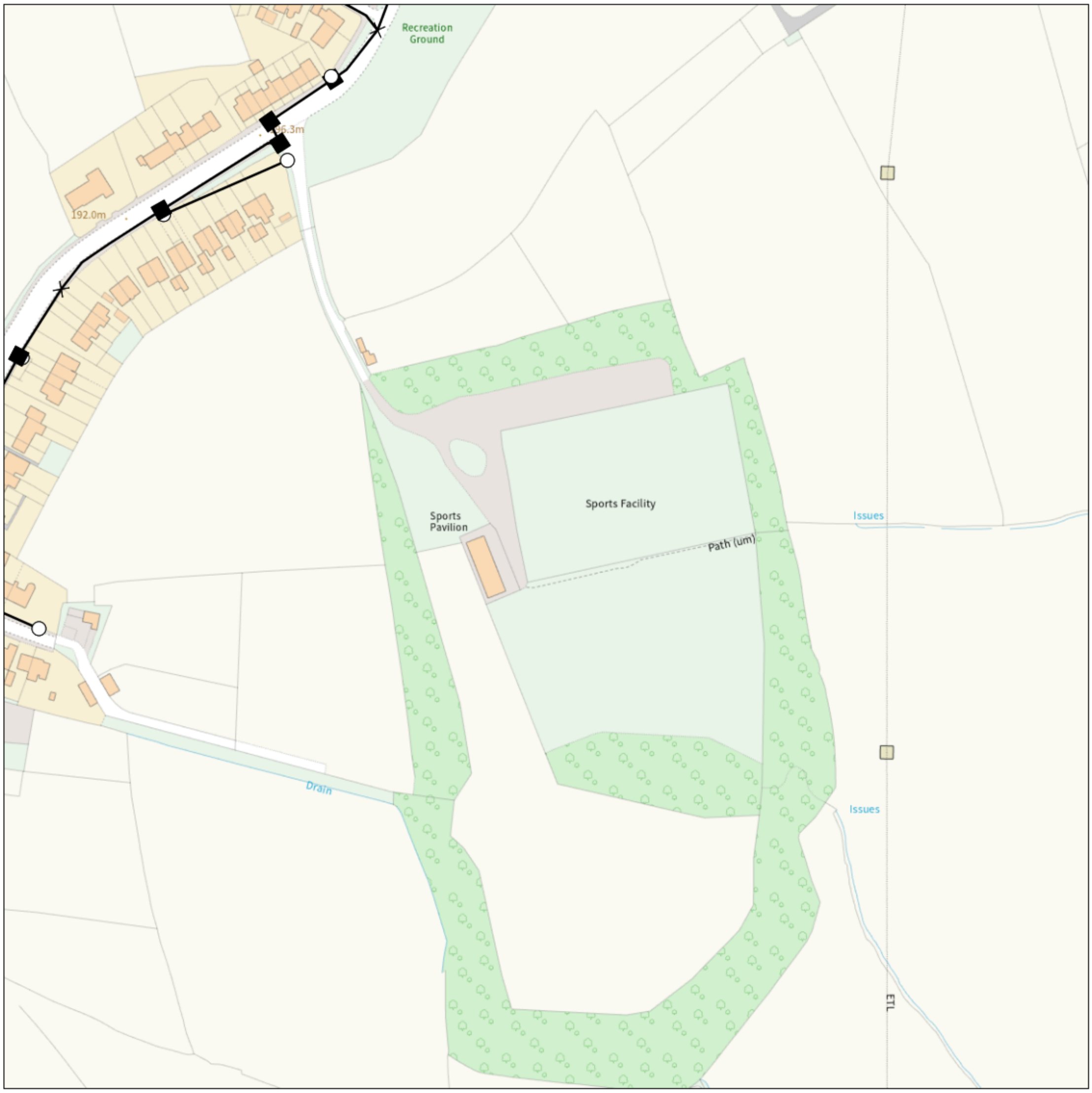
Non-LSBUD members (Asset owners not registered on LSBUD)			
Asset Owner	**Preferred contact method**	**Phone**	**Status**
BT	https://www.swns.bt.com/pls/mbe/welcome.home	08000232023	Not Notified
CityFibre	asset.team@cityfibre.com	033 3150 7282	Not Notified
Colt	plantenquiries@catelecomuk.com	01227768427	Not Notified
ENGIE	nrswa.uk@engie.com	0800 130 3600	Not Notified
GTC	https://pe.gtc-uk.co.uk/PlantEnqMembership	01359240363	Not Notified
Lumen Technologies	plantenquiries@instalcom.co.uk	02087314613	Not Notified
Mobile Broadband Network Limited	mbnl.plant.enquiries@turntown.com	01212 621 100	Not Notified
Northern Gas Networks	plantprotection@northerngas.co.uk	01915014349	Not Notified
Northern Powergrid	Safediggingplans@northernpowergrid.com	01912294294	Not Notified
Sky UK Limited	nrswa@sky.uk	02070323234	Not Notified
Sota	SOTA.plantenquiries@instalcom.co.uk		Not Notified
Teliasonera	check-network@arelion.com	0800526015	Not Notified
Utility assets Ltd	assetrecords@utilityassets.co.uk		Not Notified
Verizon Business	osp-team@uk.verizonbusiness.com	01293611736	Not Notified
Virgin Media	http://www.digdat.co.uk	08708883116	Not Notified
Vodafone	osm.enquiries@atkinsglobal.com	01454662881	Not Notified
Yorkshire Water	safemove@yorkshirewater.com	08001385385	Not Notified

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Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email cbyd@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

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Controller of Her Majesty's Stationary Office
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KEY TO BT SYMBOLS

	Planned	*Live*
PCP		
Pole		
Box		
Manhole		
Cabinet		

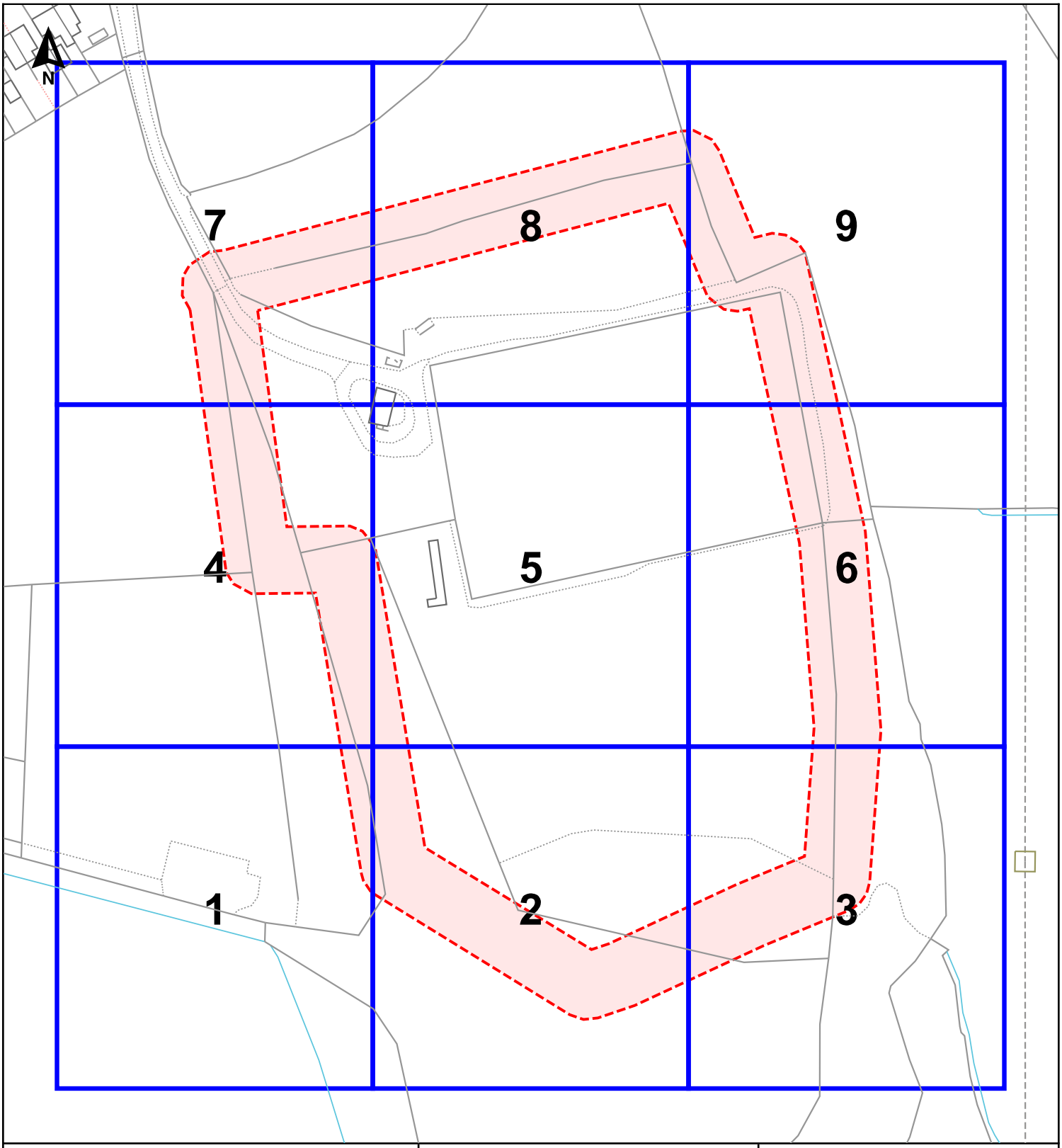
Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	*In Place*	*Pending Remove*	*Not In Use*
Power Cable				
Power Duct				N/A

BT Ref : QAT02165K
Map Reference : (centre) SE1975928717
Easting/Northing : (centre) 419759,428717
Issued : 18/05/2022 14:16:58

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



Terms and Conditions

Electric cables and/or overhead line information shown on the record plans are to be used in accordance with the Health & Safety Executive's Booklet HS(G)47, "Avoiding Danger from Underground Services" and Guidance Note GS 6, "Avoidance of Danger from Overhead Electric Lines".
Record plans do not always show out of commission cables or service cables from Northern Powergrid\'s mains to adjoining or cross road properties.
Plans do not show local authority owned public lighting or sign cables. The information is provided as a service by NorthernPowergrid and does not impart any legal obligation on their part.
Persons using it are reminded of their responsibility to execute works safely to avoid damaging Northern Powergrid\'s apparatus.

Further advice or assistance is available from the Records Information Centre on 0191 2294296
In an emergency or outside normal working hours contact our customer information centre on 0800 668877
Cable depths shown were correct at the time cables were laid however alterations to ground levels or cable disposition may have taken place.

Legend:

Underground Cables:

- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

Overhead Conductors:

- 132kV
- 66kV
- 33kV
- 25kV
- LV Mains
- LV Service
- 20kV
- 11kV
- 6kV
- 3kV
- Aux

0 20 40 60 80m

NORTHERN POWERGRID

Job Reference : SD832993
STU5725

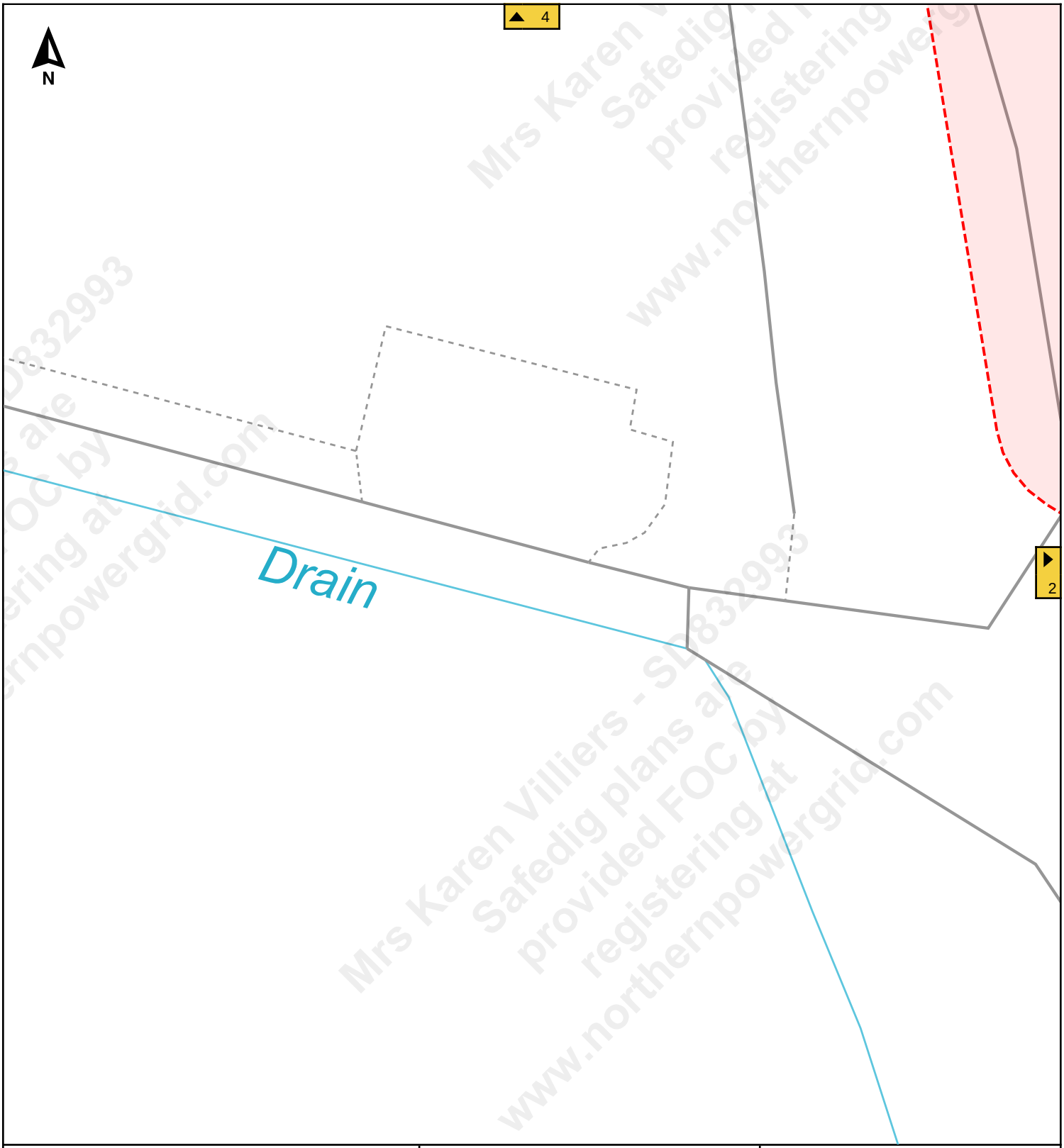
Scale : 1:1600

Date : 18/05/2022

Grid Coordinates : 419769 428708

Produced For :
Mrs Karen Villiers

Overview Page



Terms and Conditions

Electric cables and/or overhead line information shown on the record plans are to be used in accordance with the Health & Safety Executive's Booklet HS(G)47, "Avoiding Danger from Underground Services" and Guidance Note GS 6, "Avoidance of Danger from Overhead Electric Lines".
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- 25kV
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- LV Service
- 20kV
- 11kV
- 6kV
- 3kV
- Aux

0 5 10 15 20m

NORTHERN POWERGRID

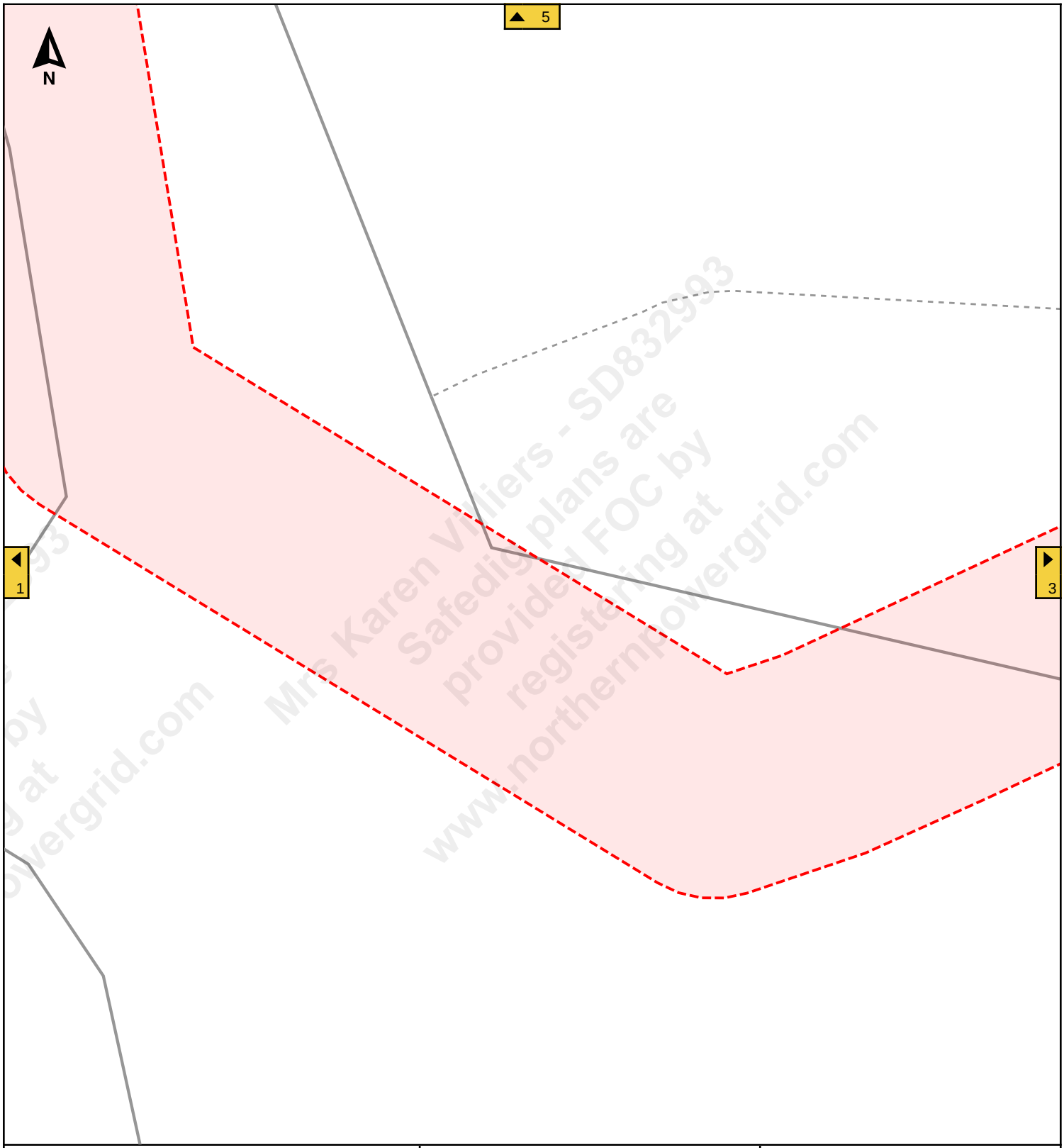
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419675 428605

Produced For :
Mrs Karen Villiers



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Legend:

Underground Cables:

- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

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- 25kV
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0 5 10 15 20m

NORTHERN POWERGRID

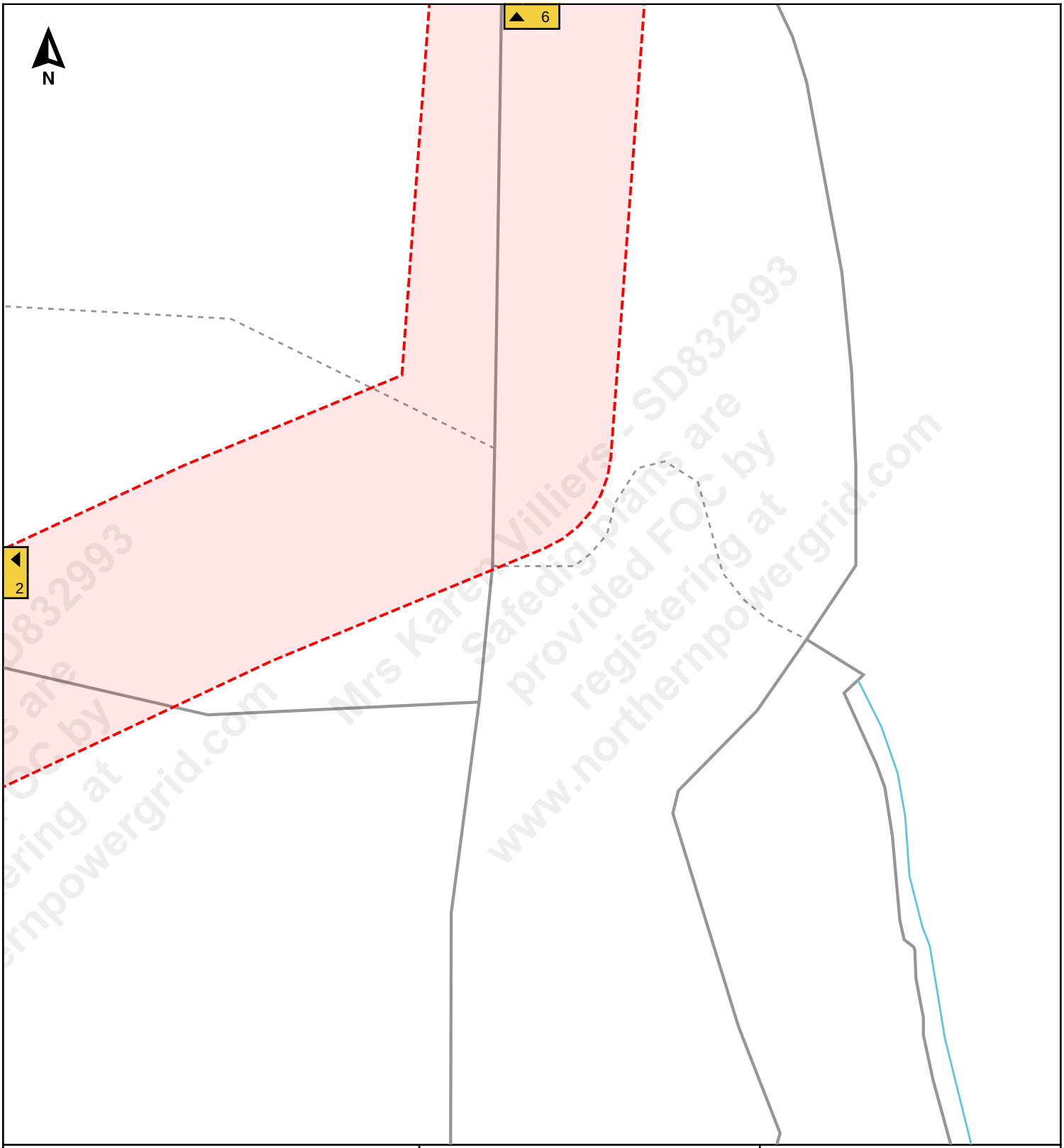
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419769 428605

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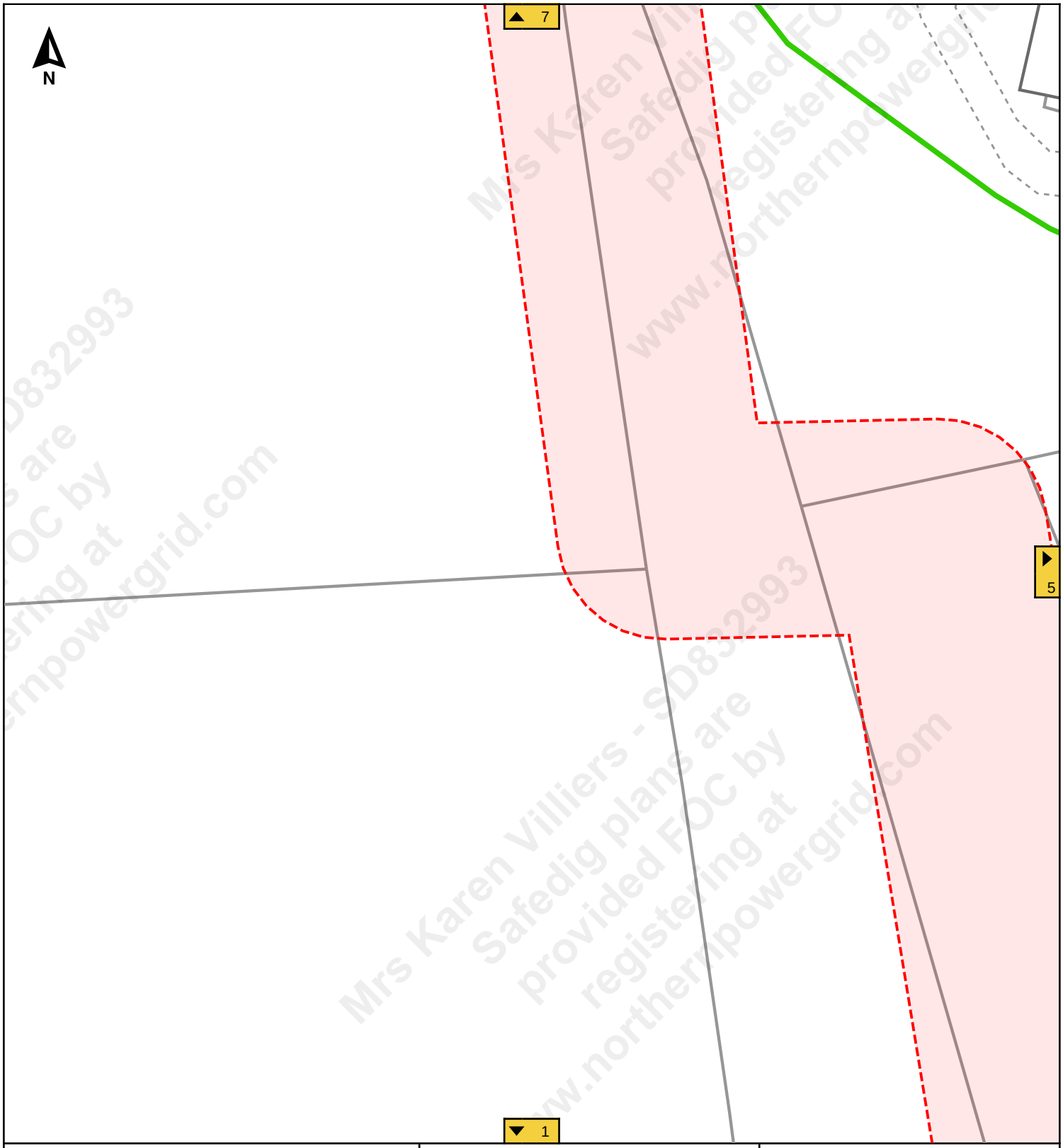
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419863 428605

Produced For :
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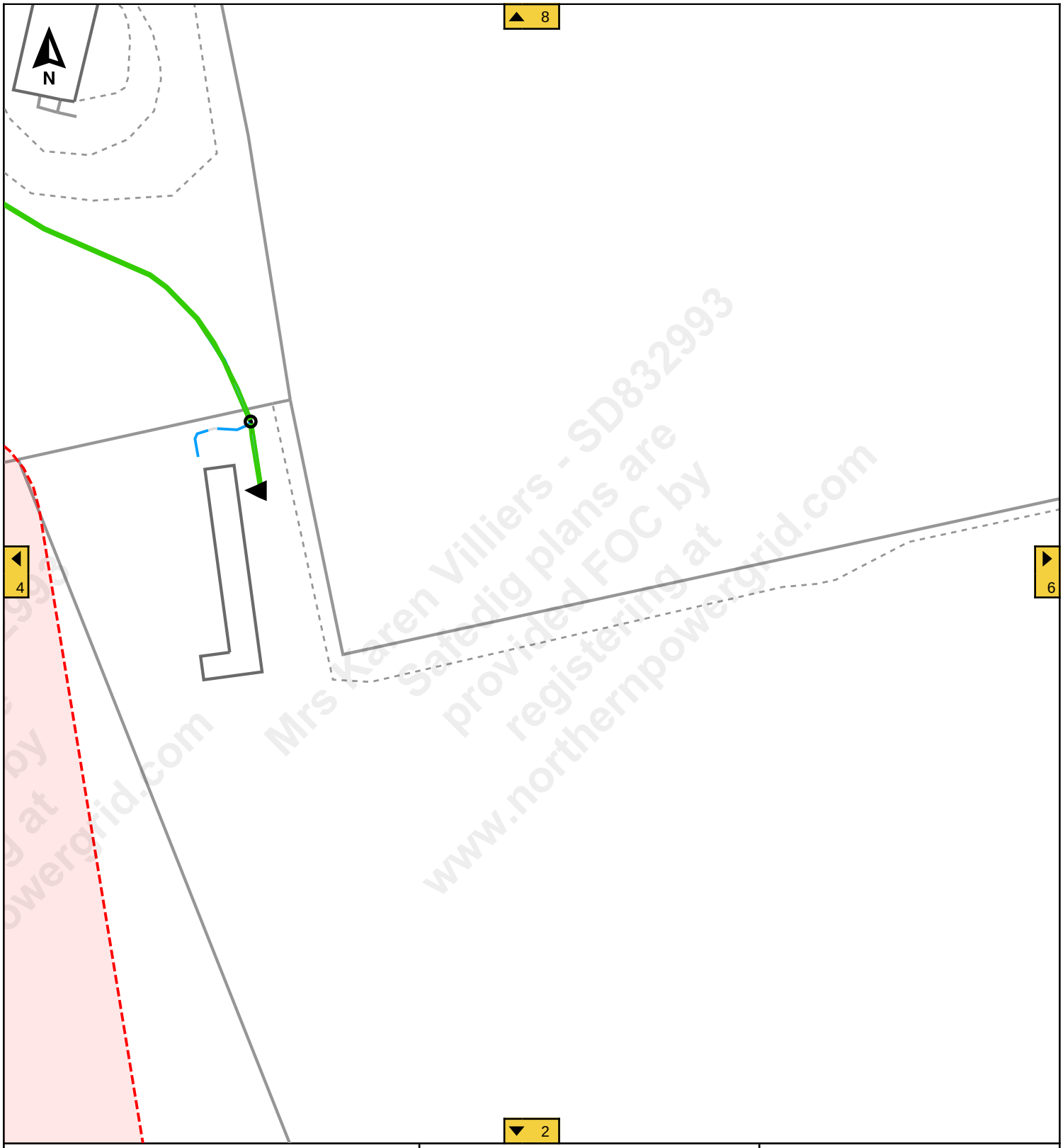
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419675 428708

Produced For :
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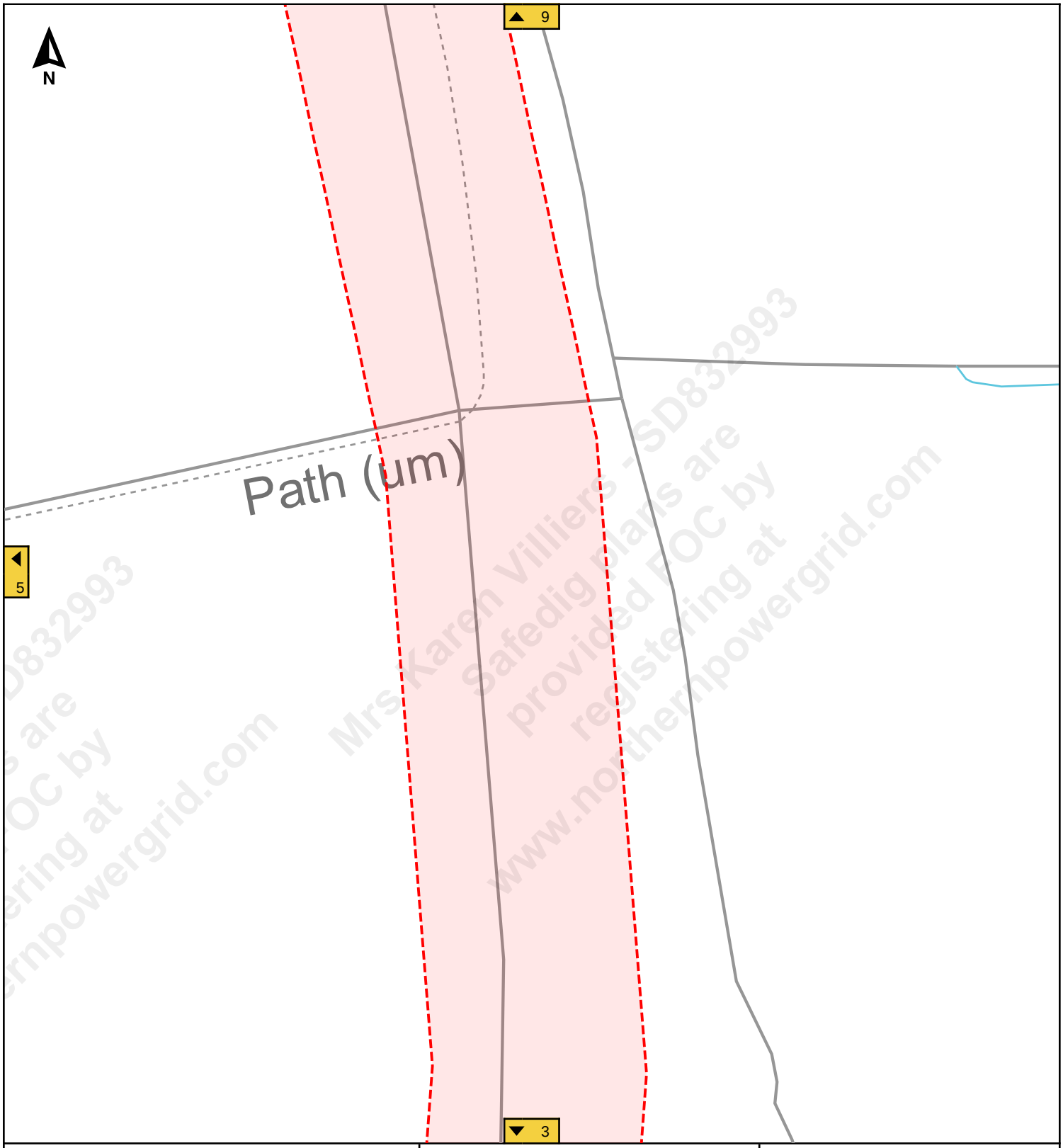
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Date : 18/05/2022

Grid Coordinates : 419769 428708

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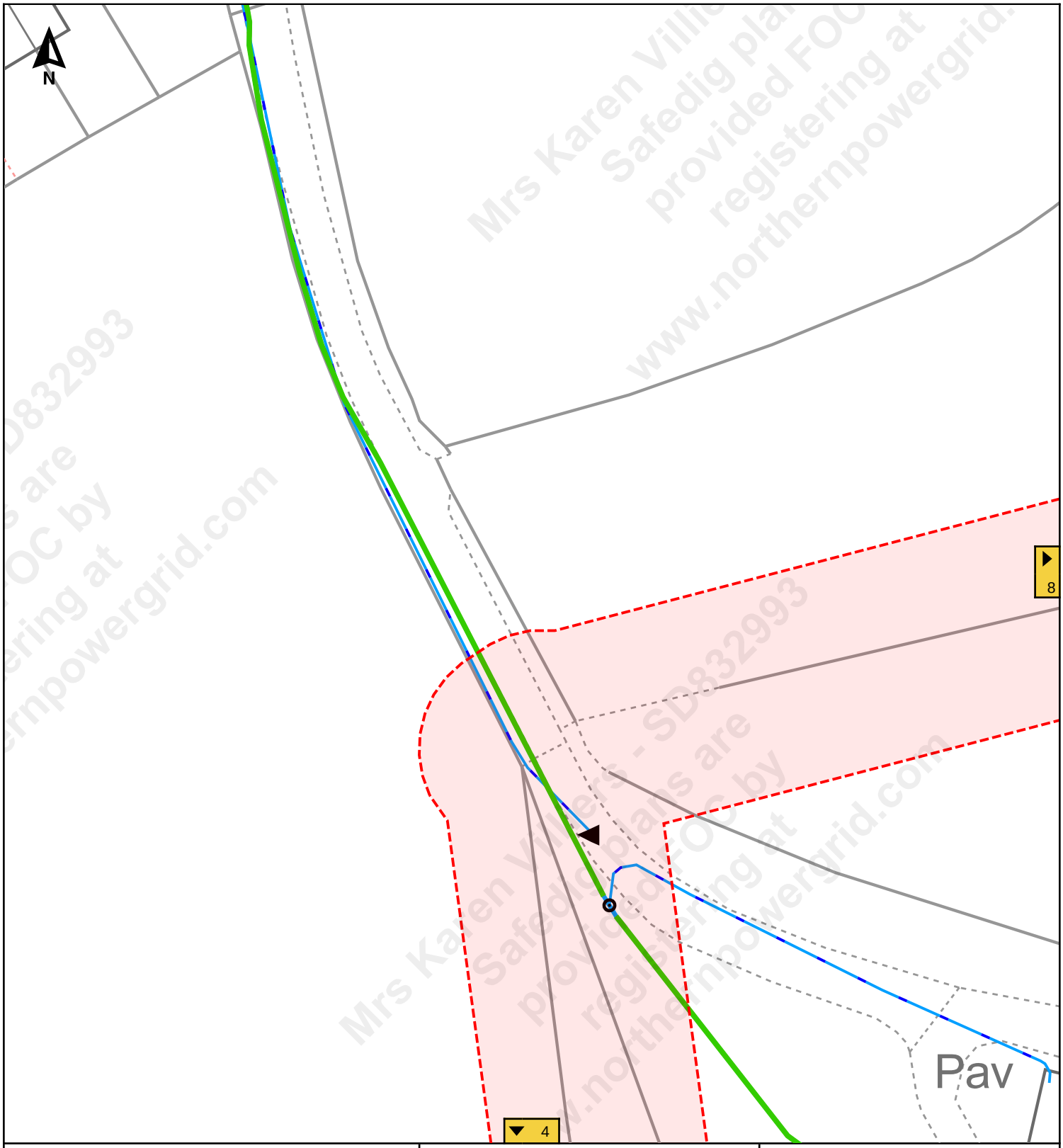
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STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419863 428708

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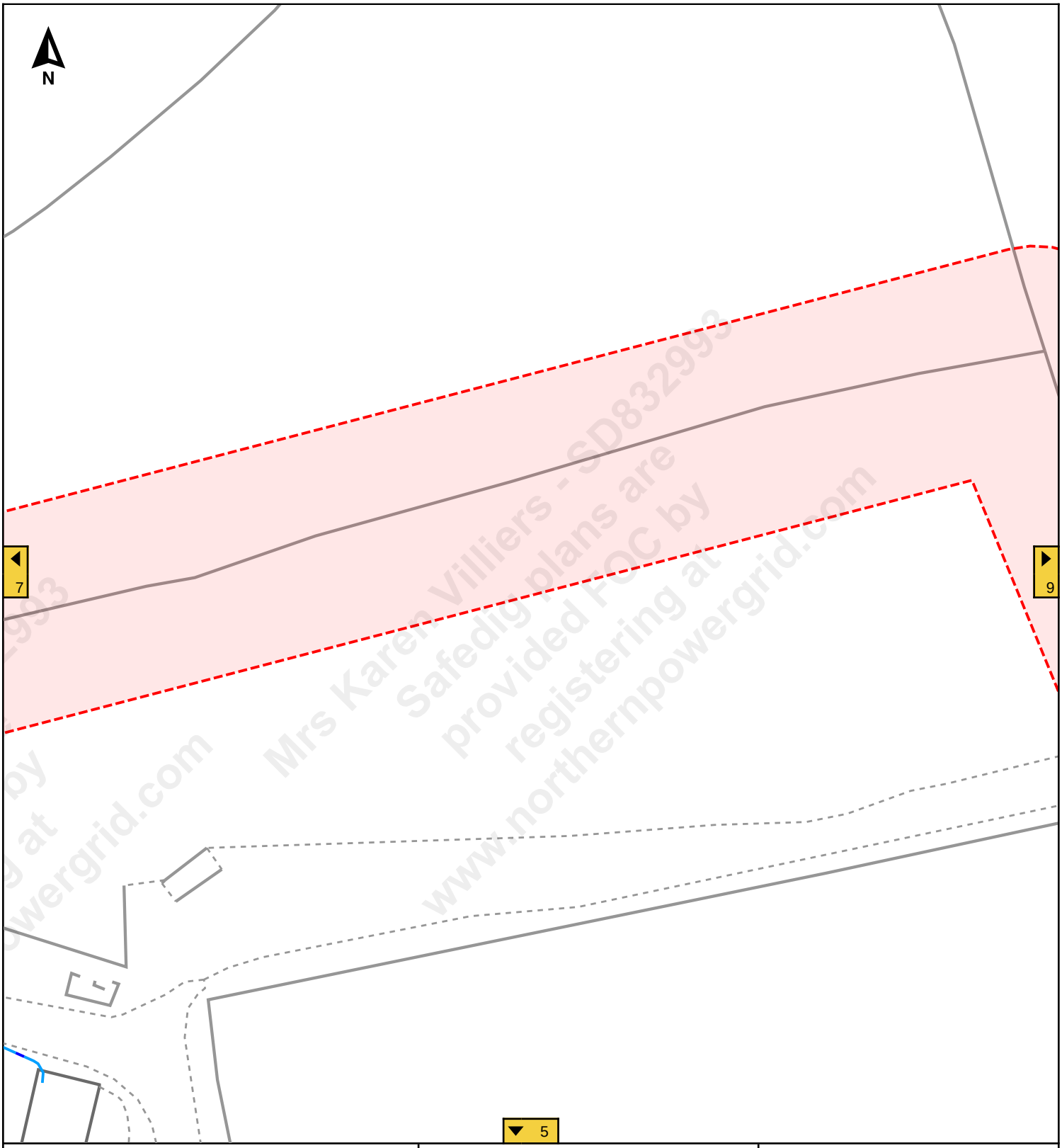
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STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419675 428810

Produced For :
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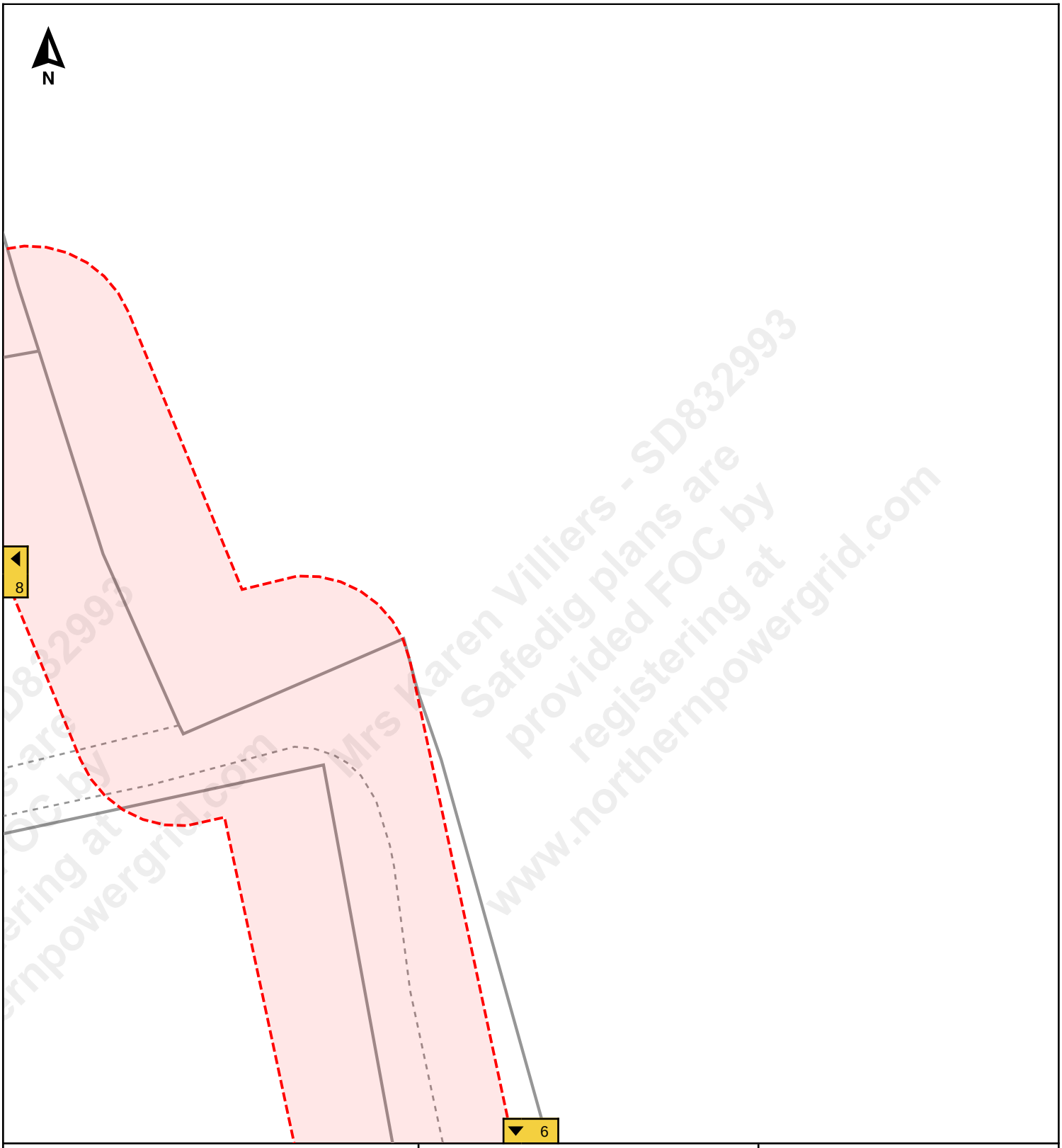
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Date : 18/05/2022

Grid Coordinates : 419769 428810

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Safedig plans are provided FOC by registering at www.northernpowergrid.com

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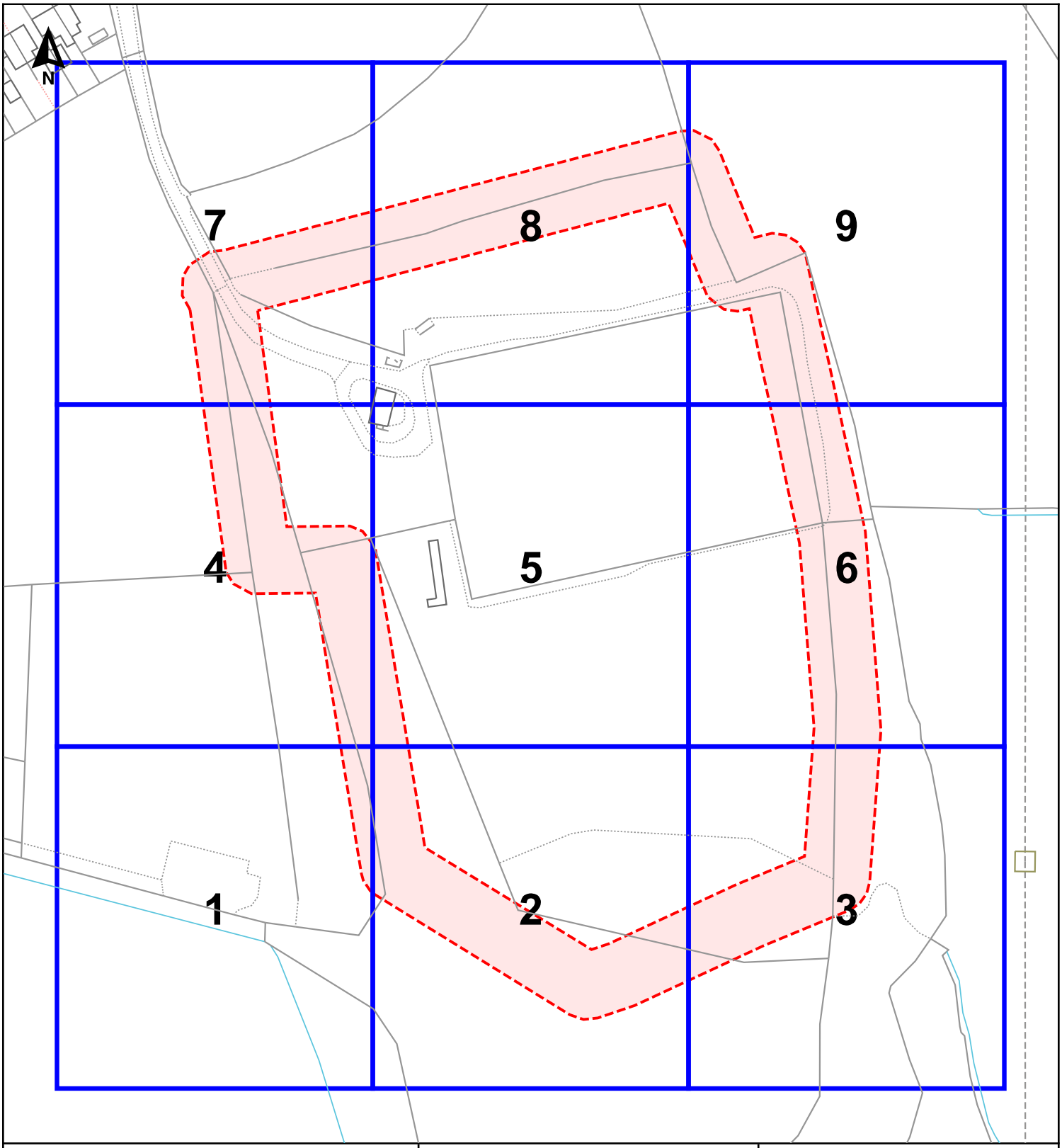
Job Reference : SD832993
STU5725

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Grid Coordinates : 419863 428810

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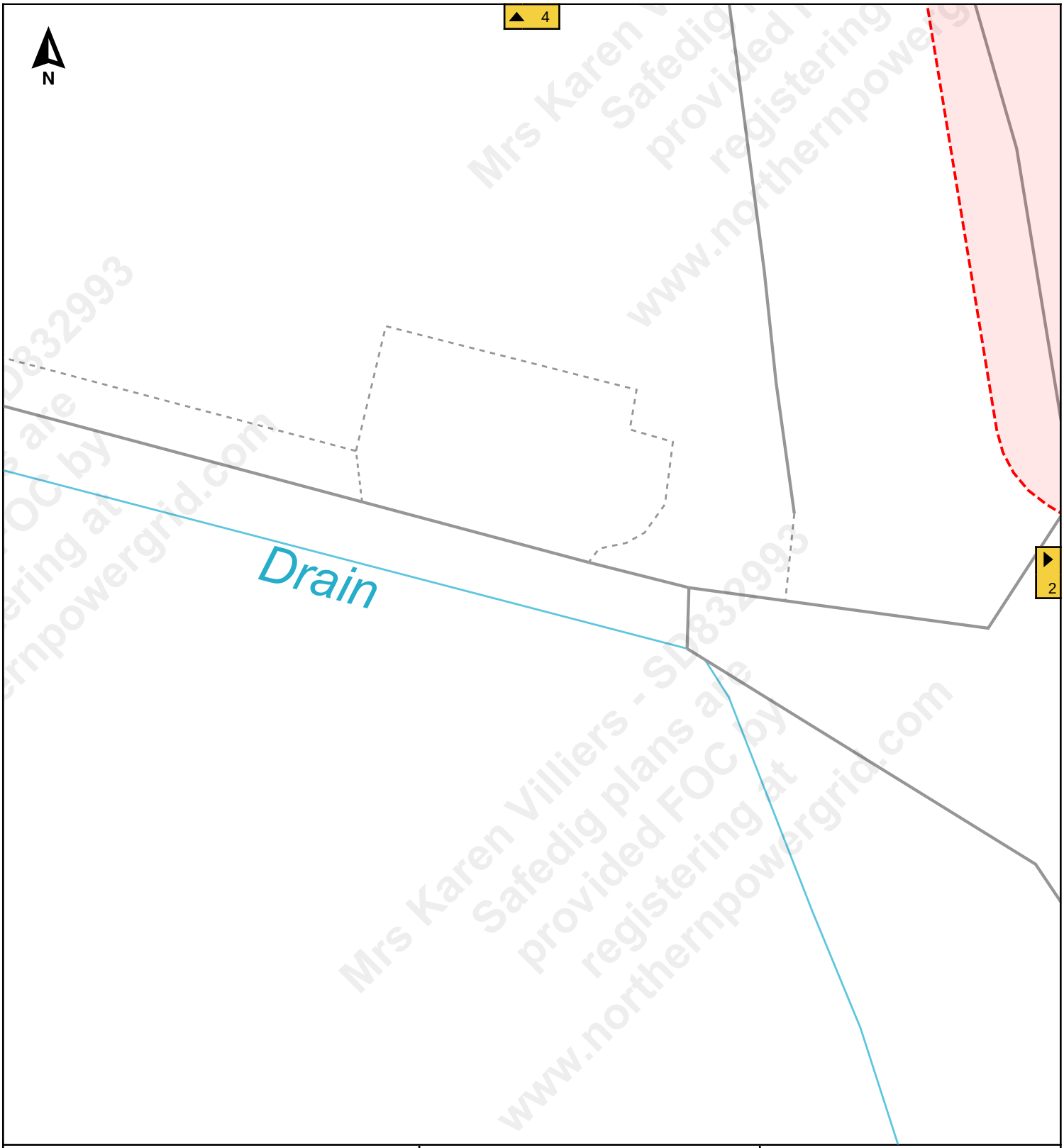
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Date : 18/05/2022

Grid Coordinates : 419769 428708

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Overview Page



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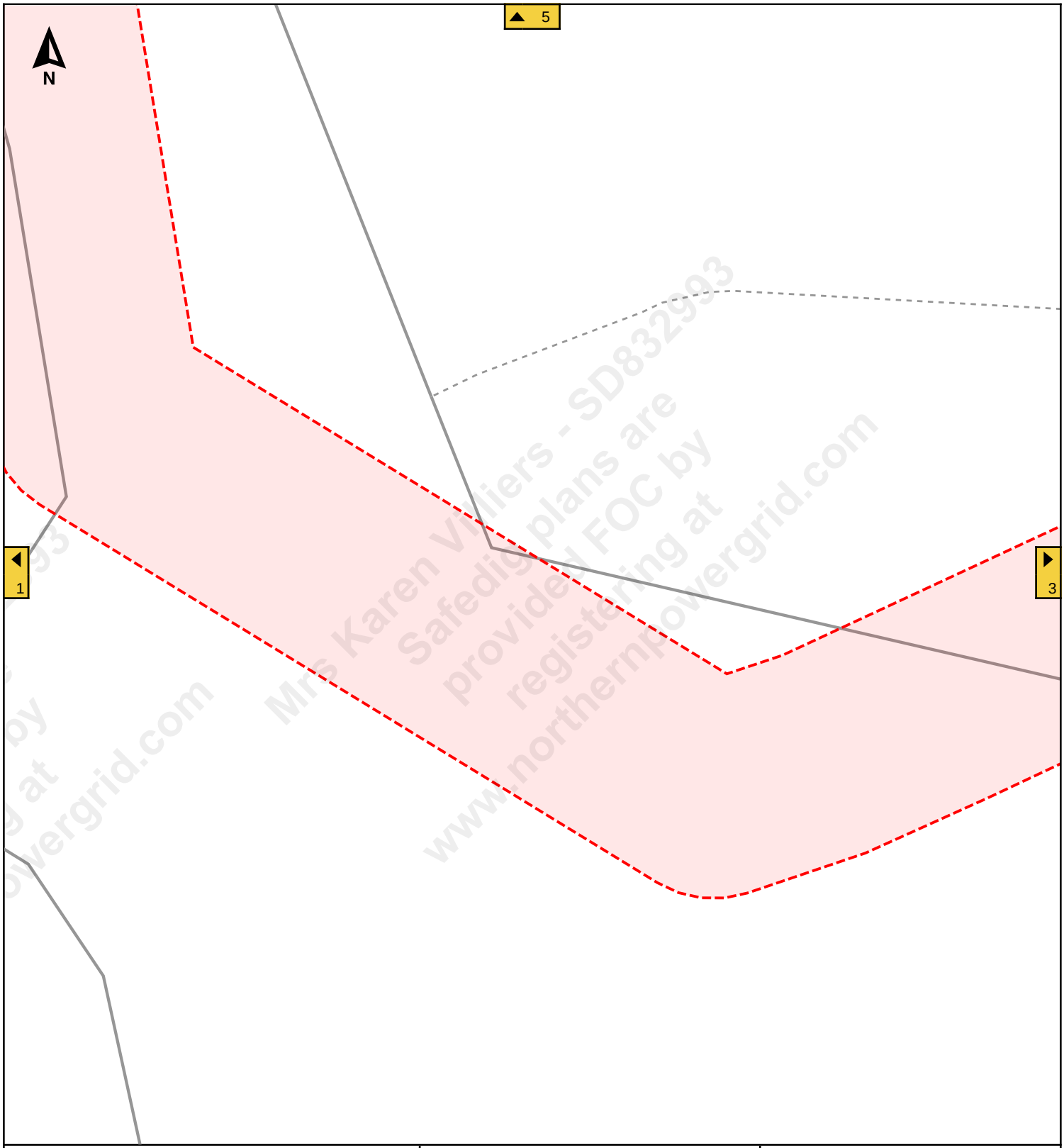
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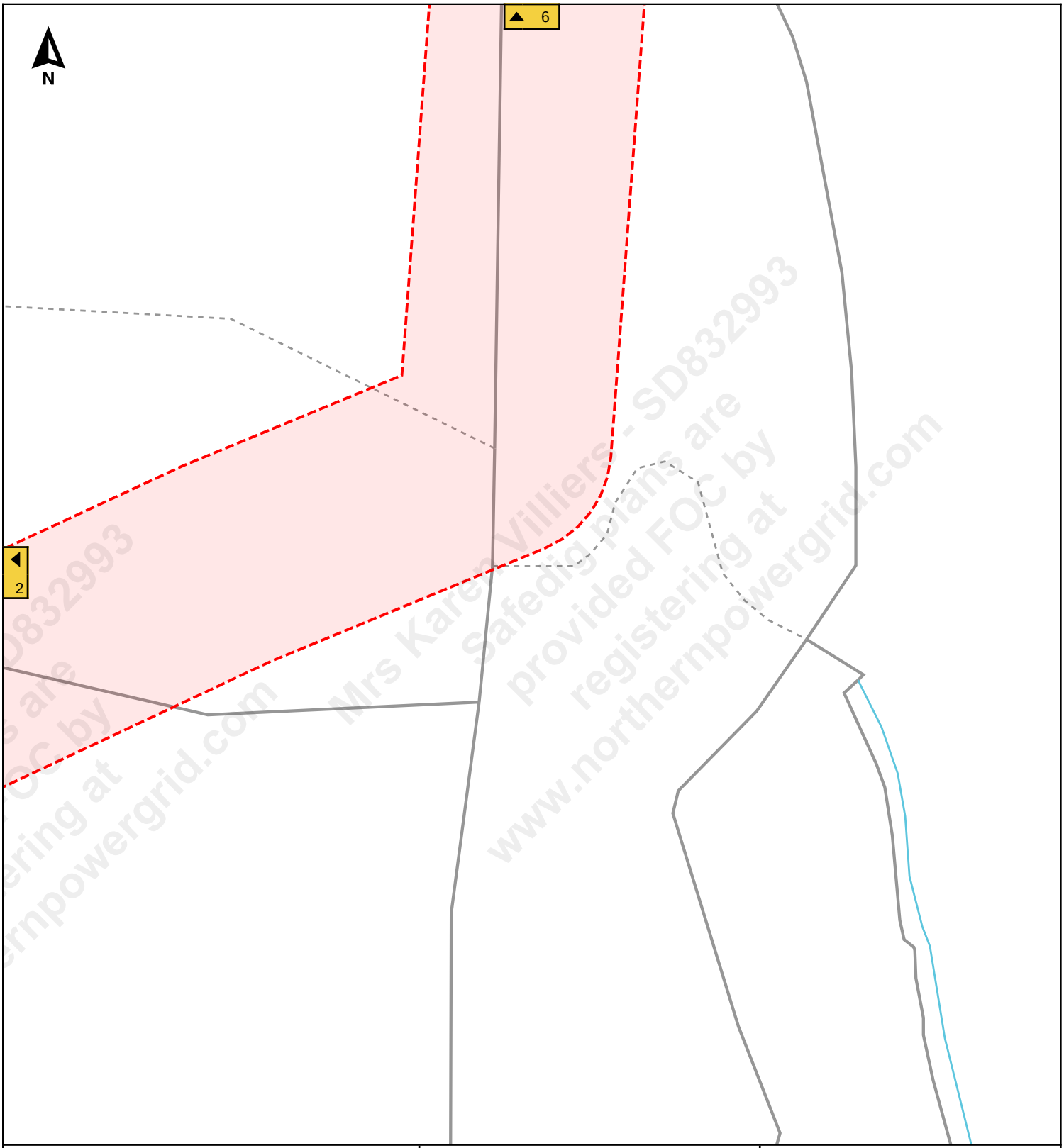
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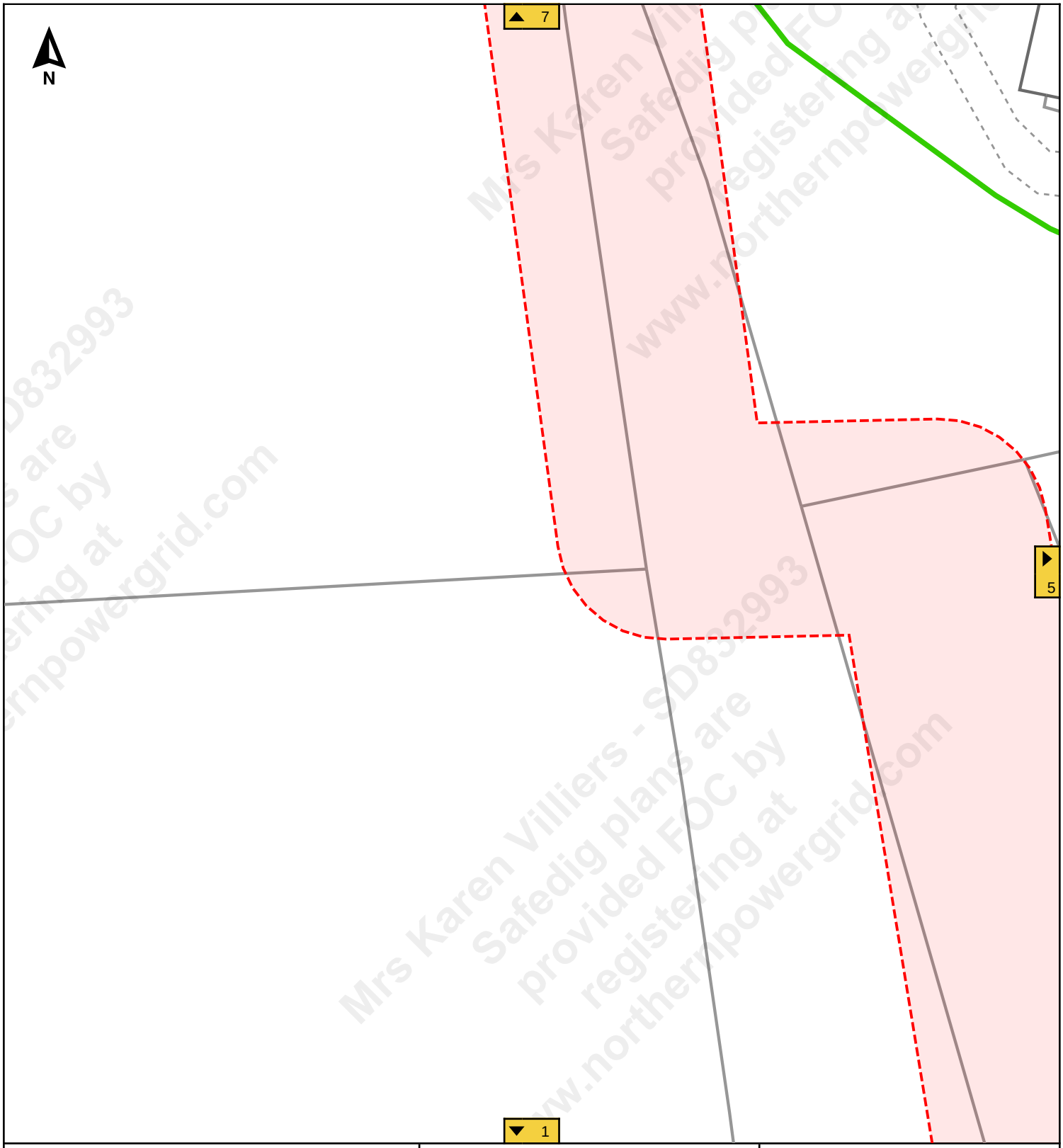
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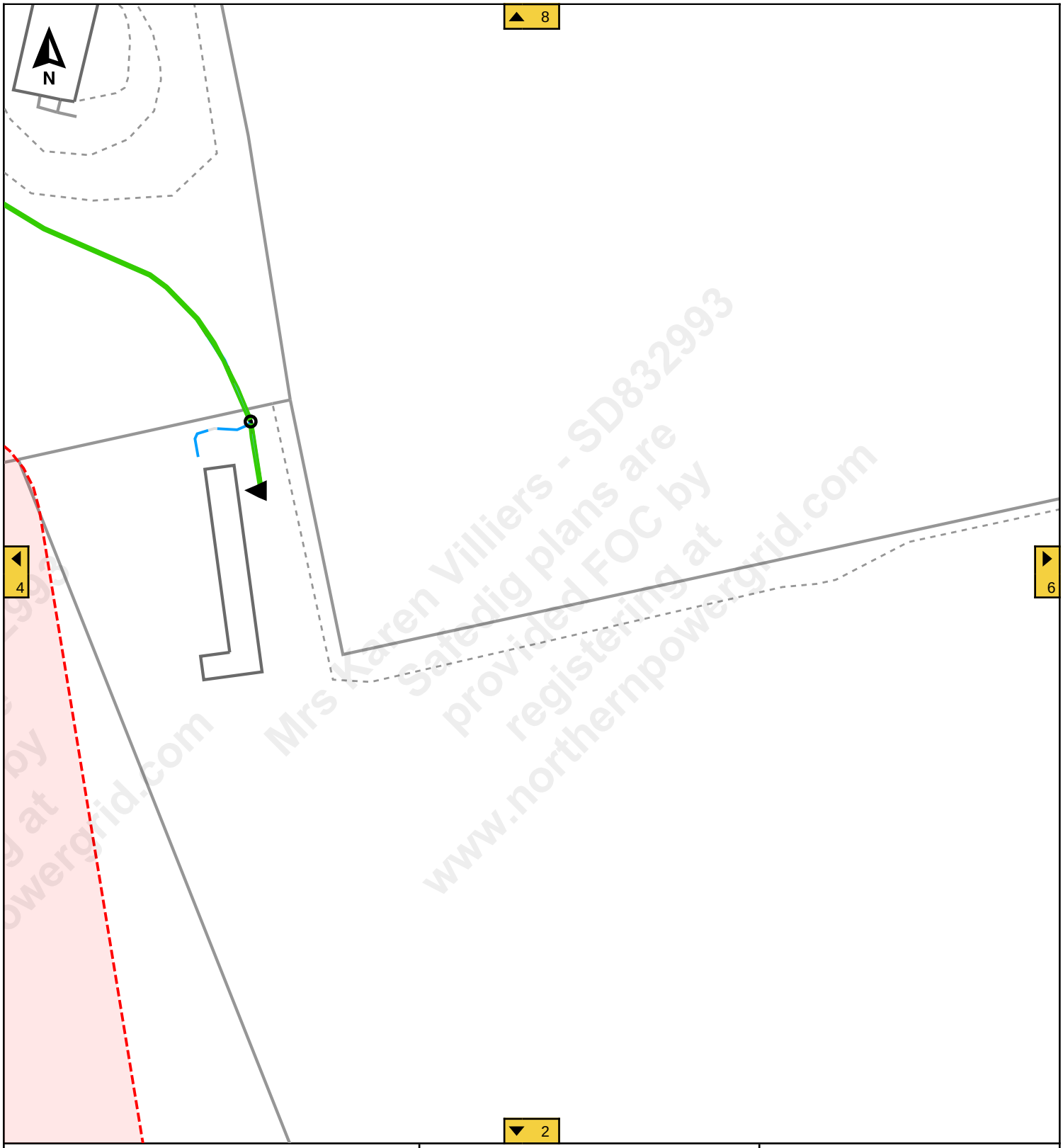
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Legend:

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- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

Overhead Conductors:

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- 33kV
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- LV Service
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- 6kV
- 3kV
- Aux

0 5 10 15 20m

NORTHERN POWERGRID

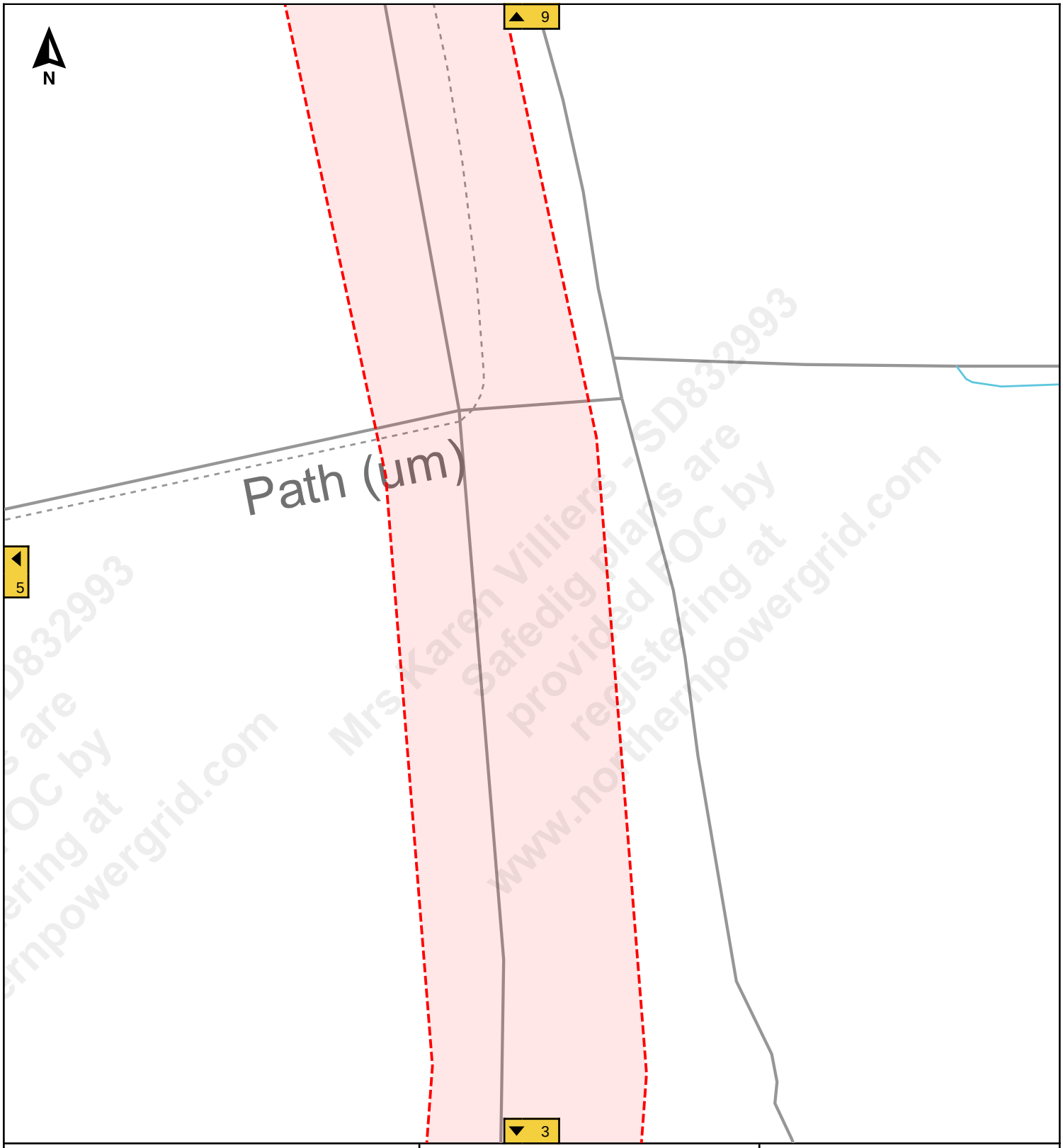
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419769 428708

Produced For :
Mrs Karen Villiers



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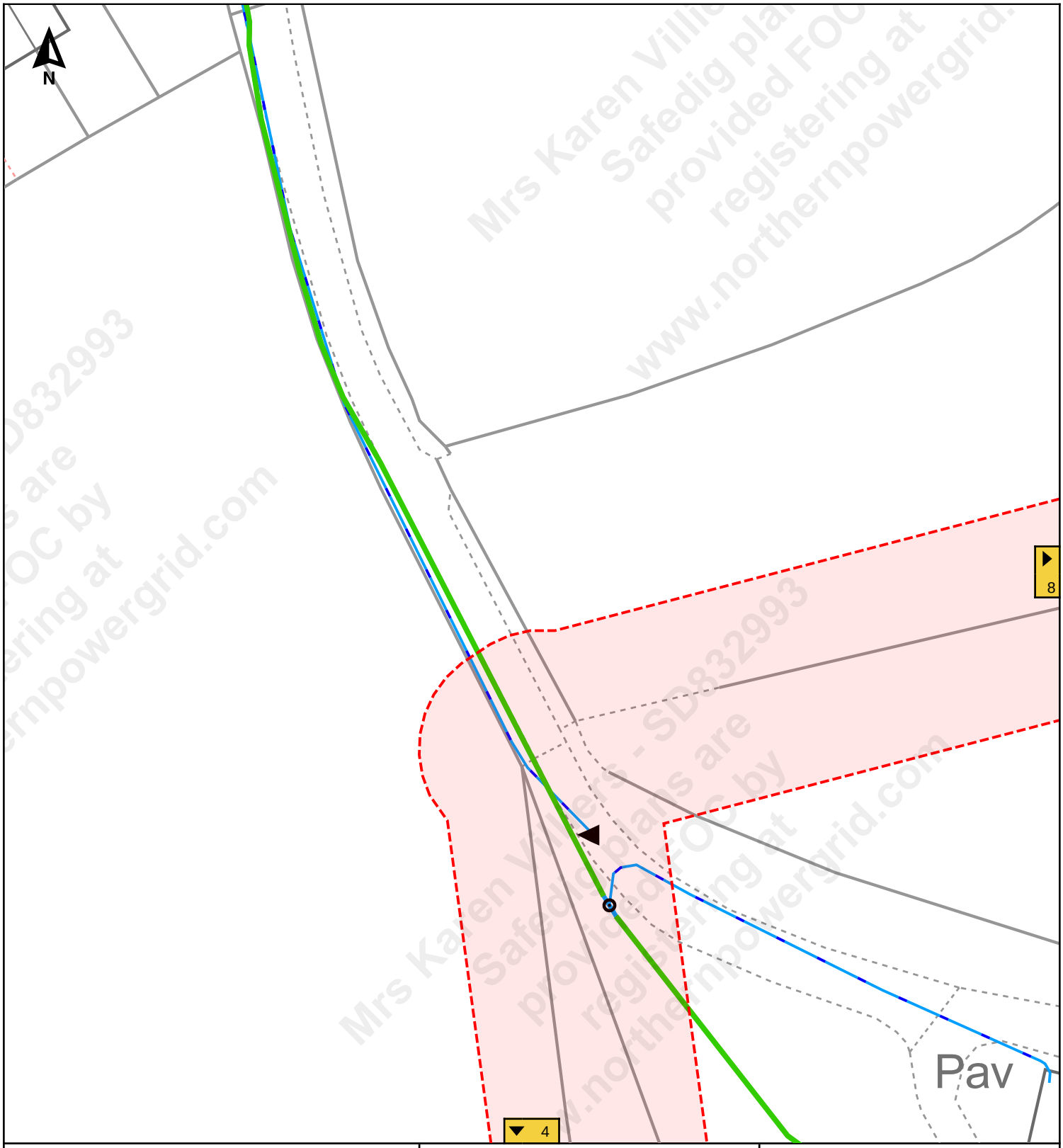
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STU5725

Scale : 1:500

Date : 18/05/2022

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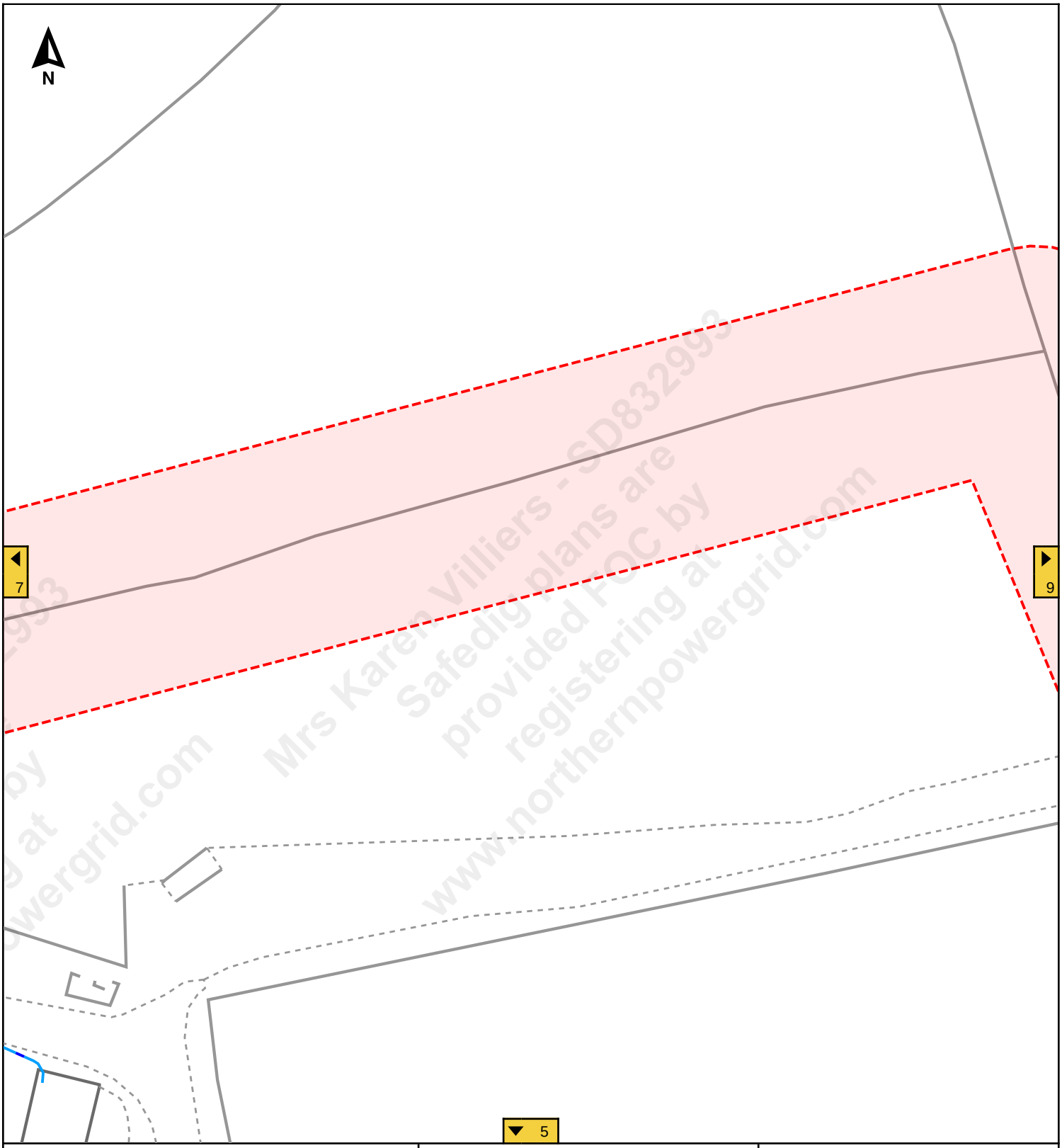
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419675 428810

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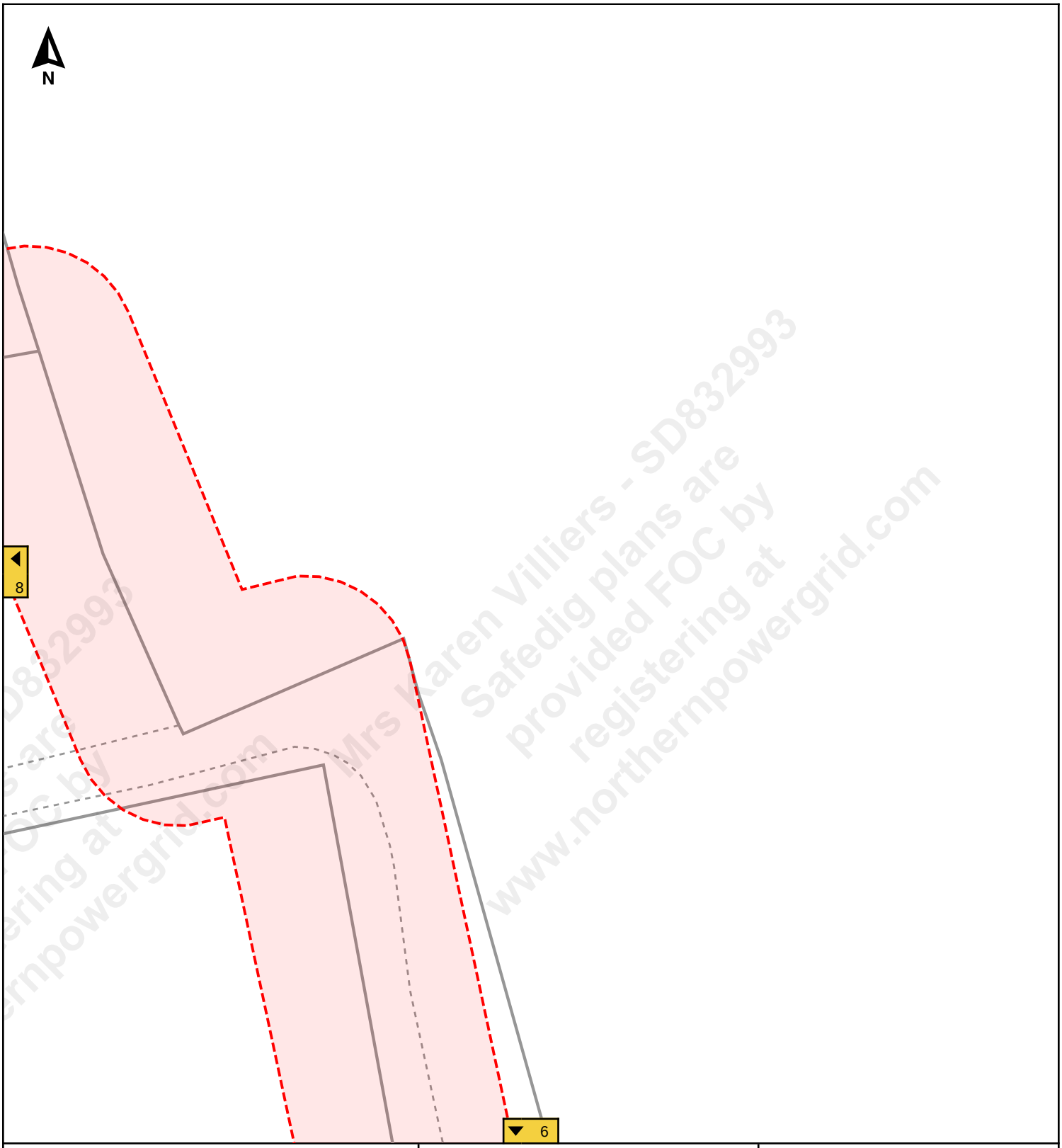
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Grid Coordinates : 419769 428810

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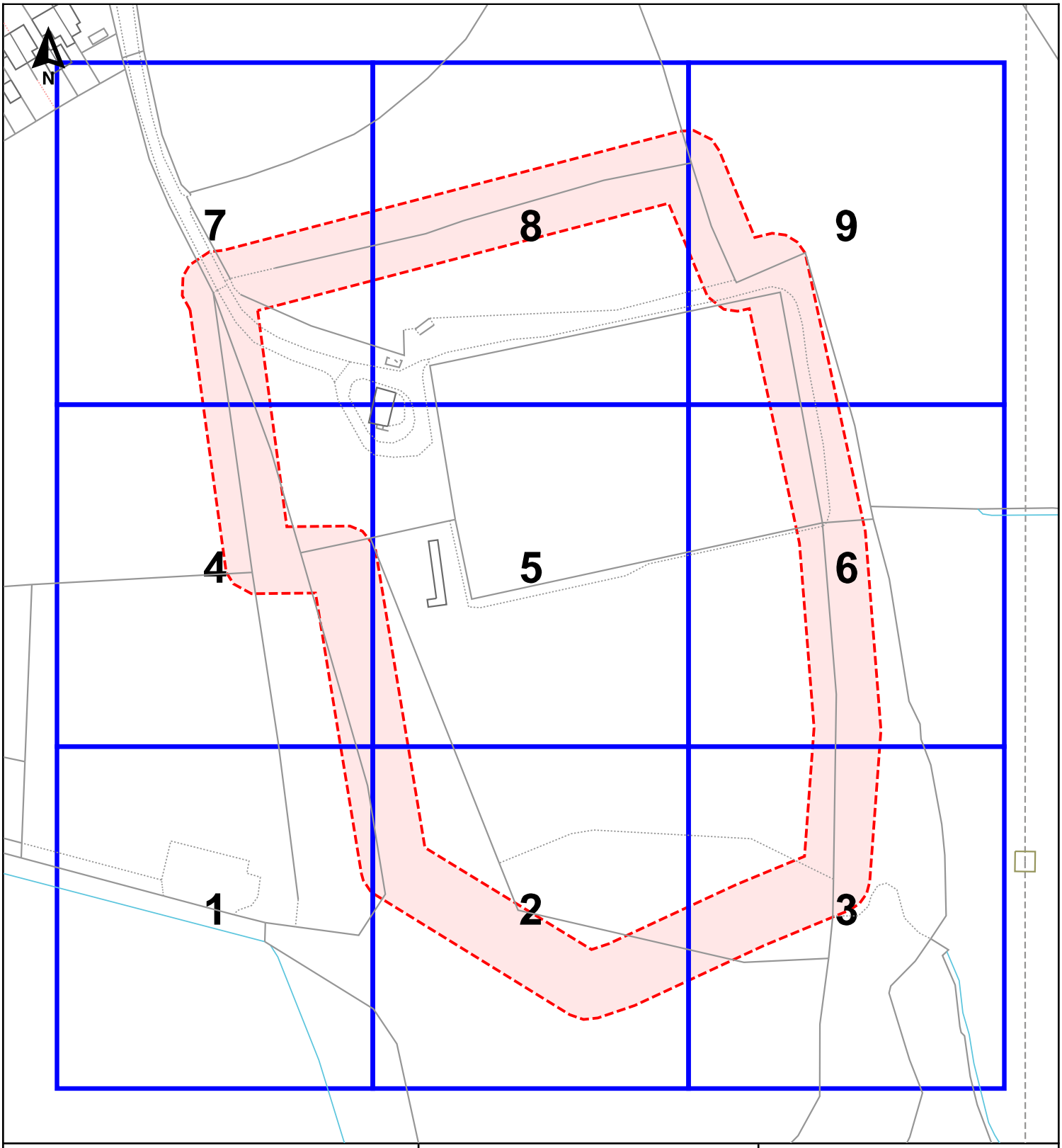
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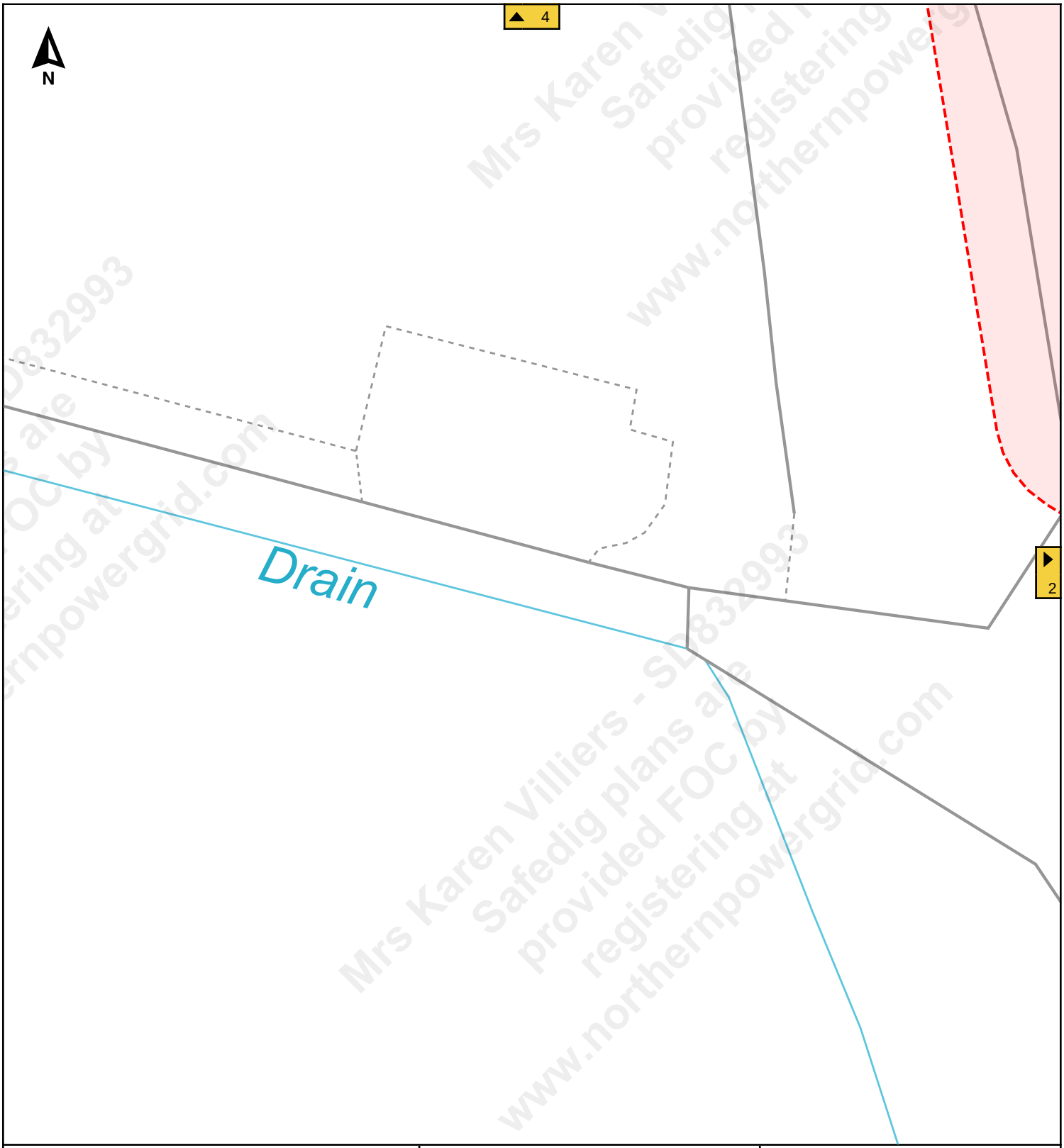
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Date : 18/05/2022

Grid Coordinates : 419769 428708

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Overview Page



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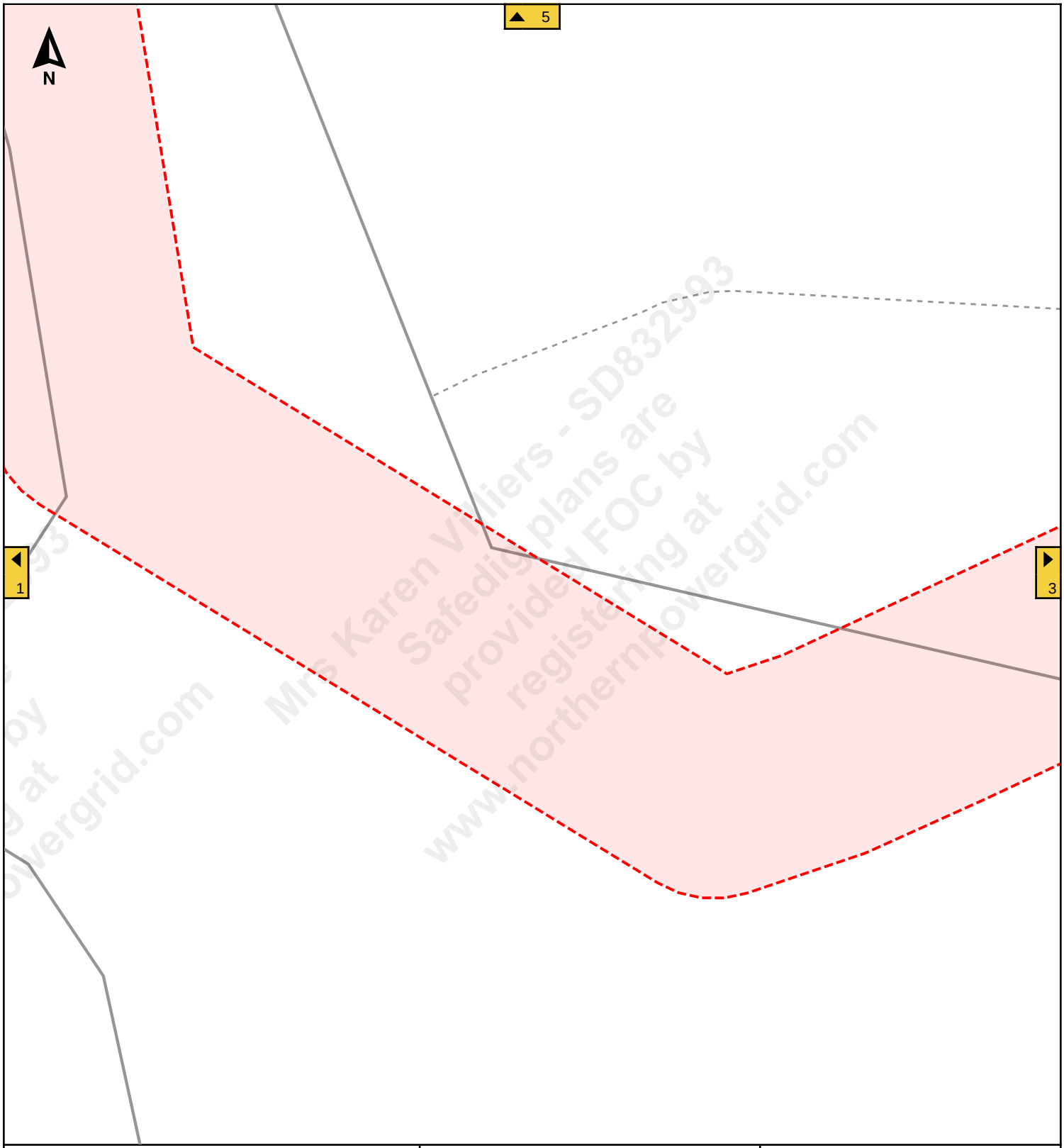
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Grid Coordinates : 419675 428605

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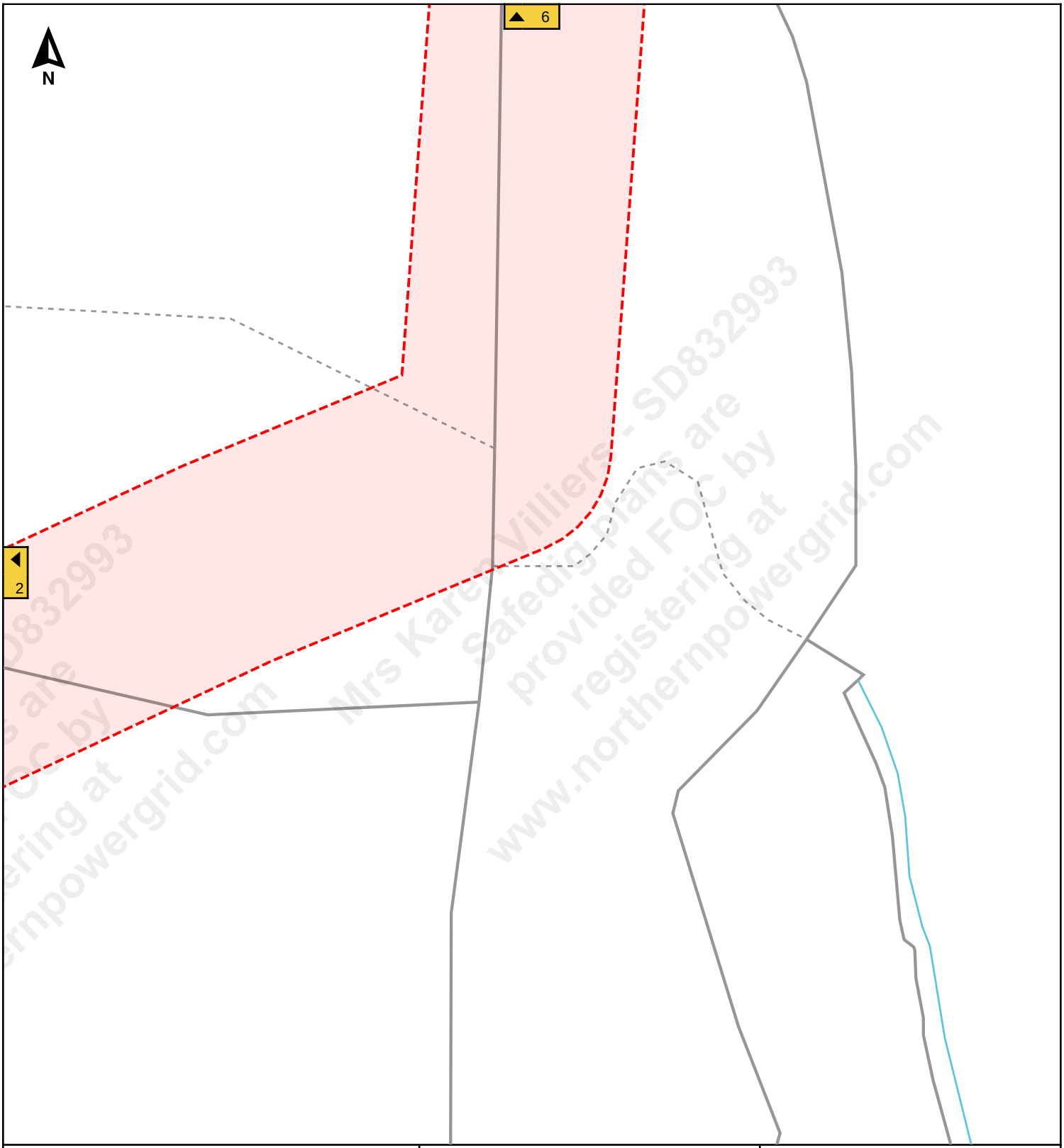
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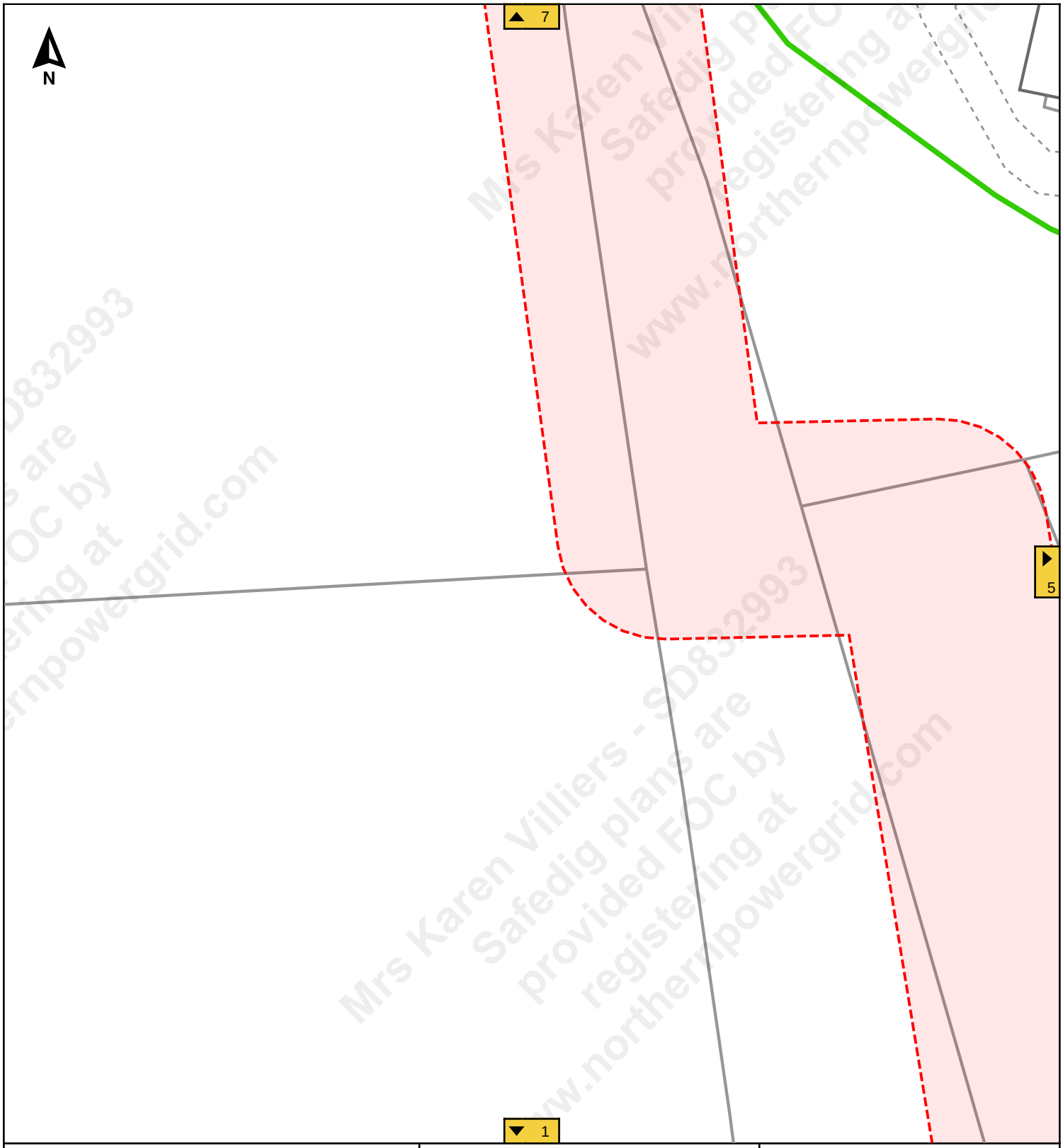
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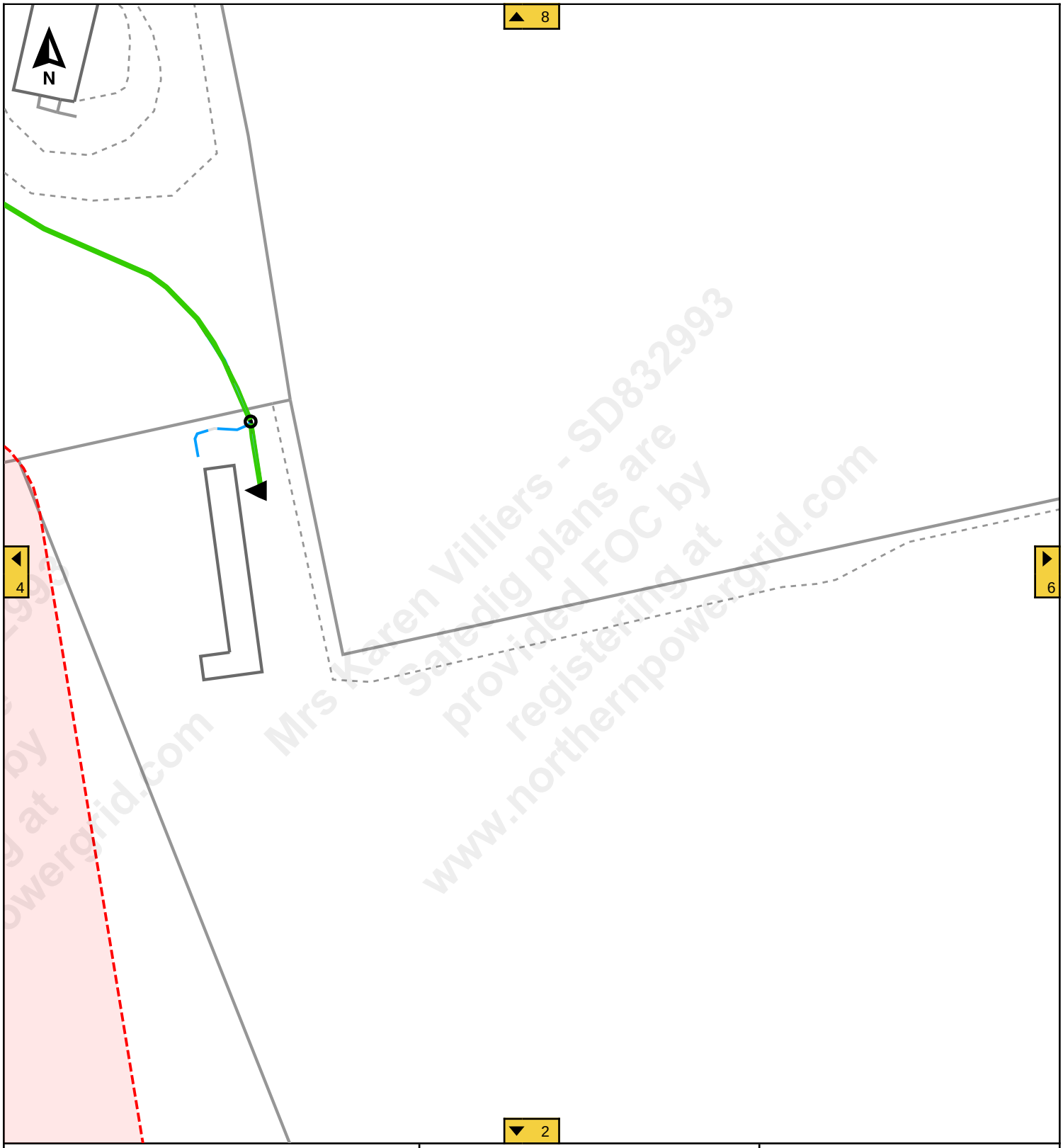
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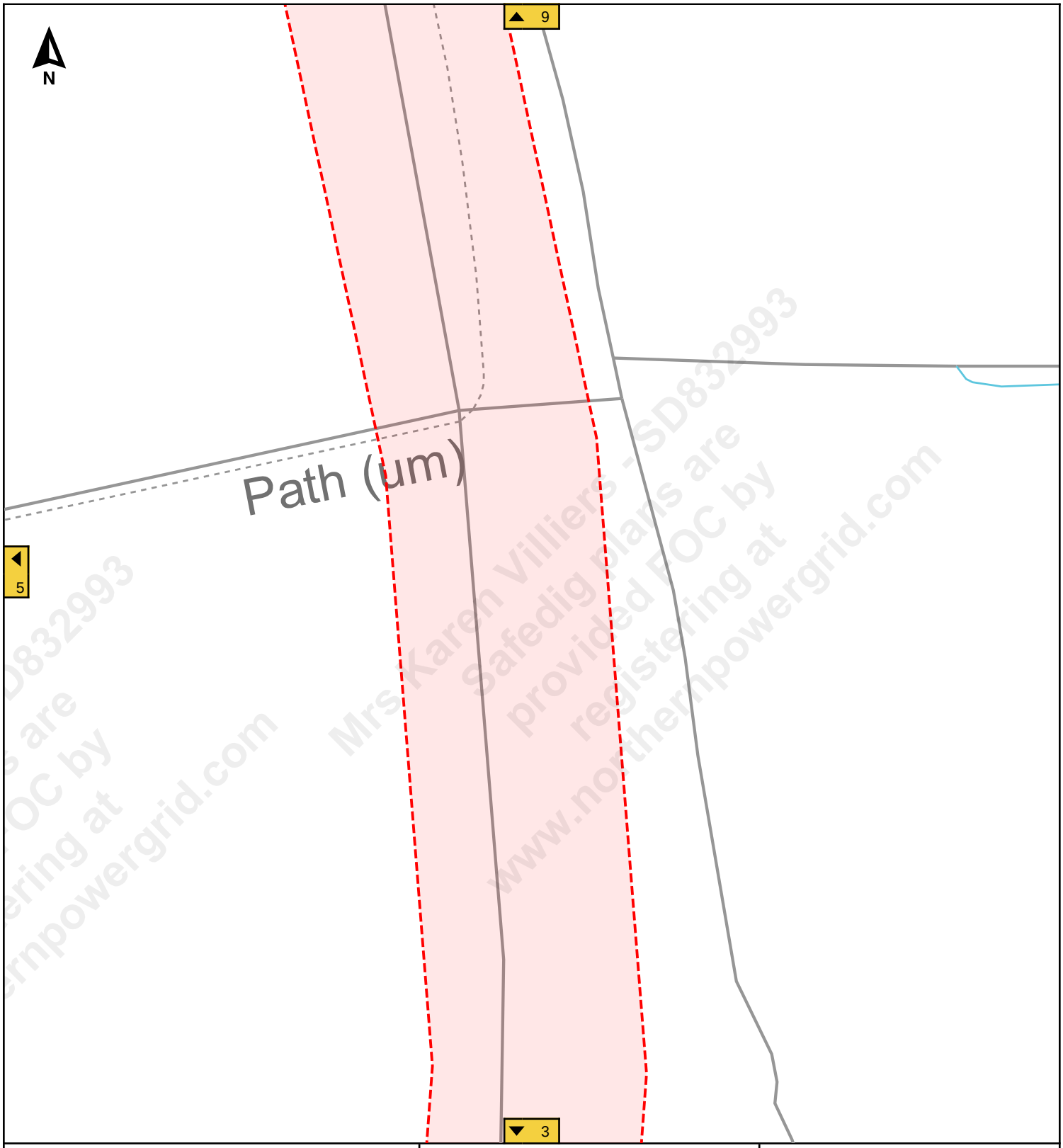
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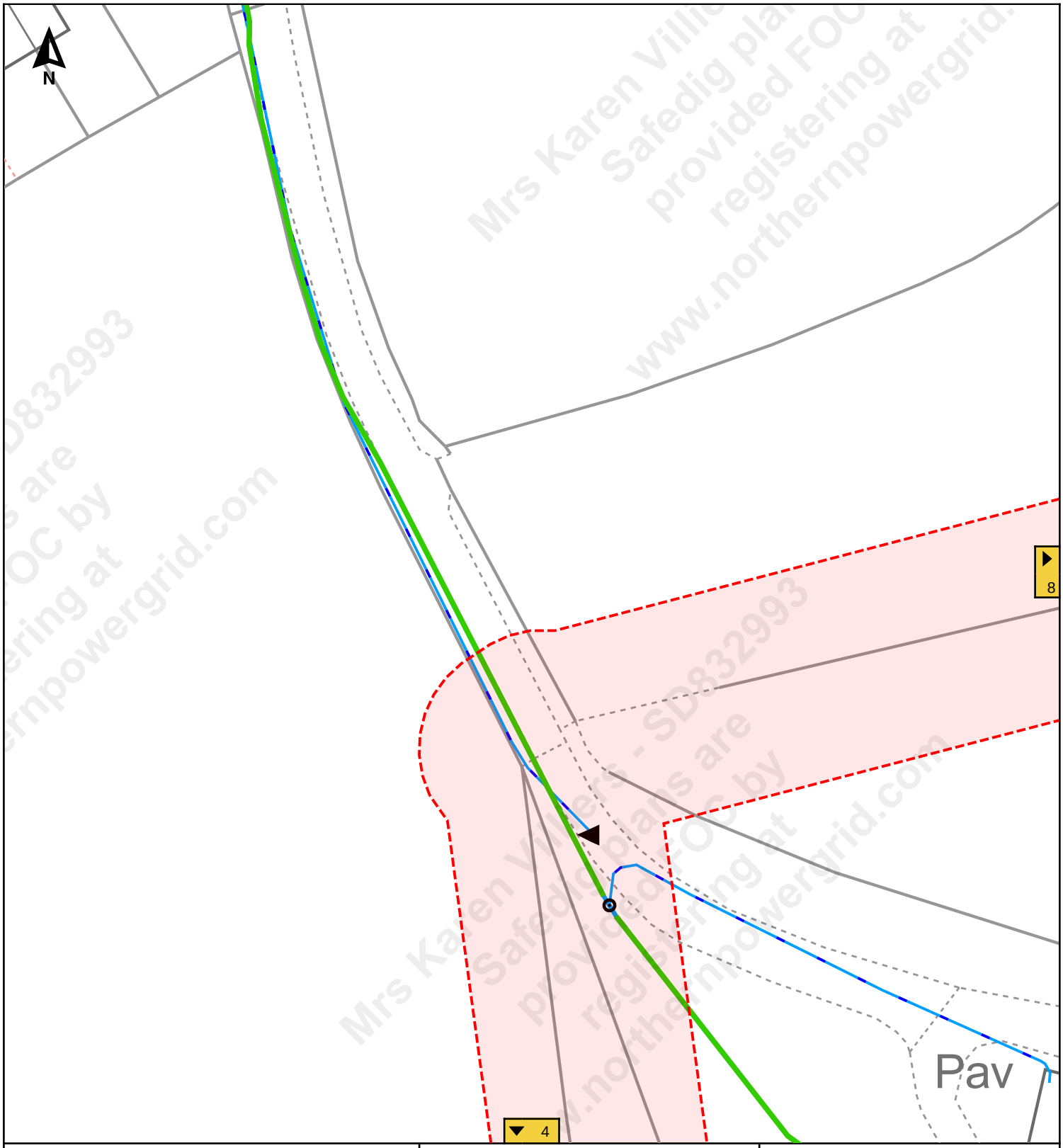
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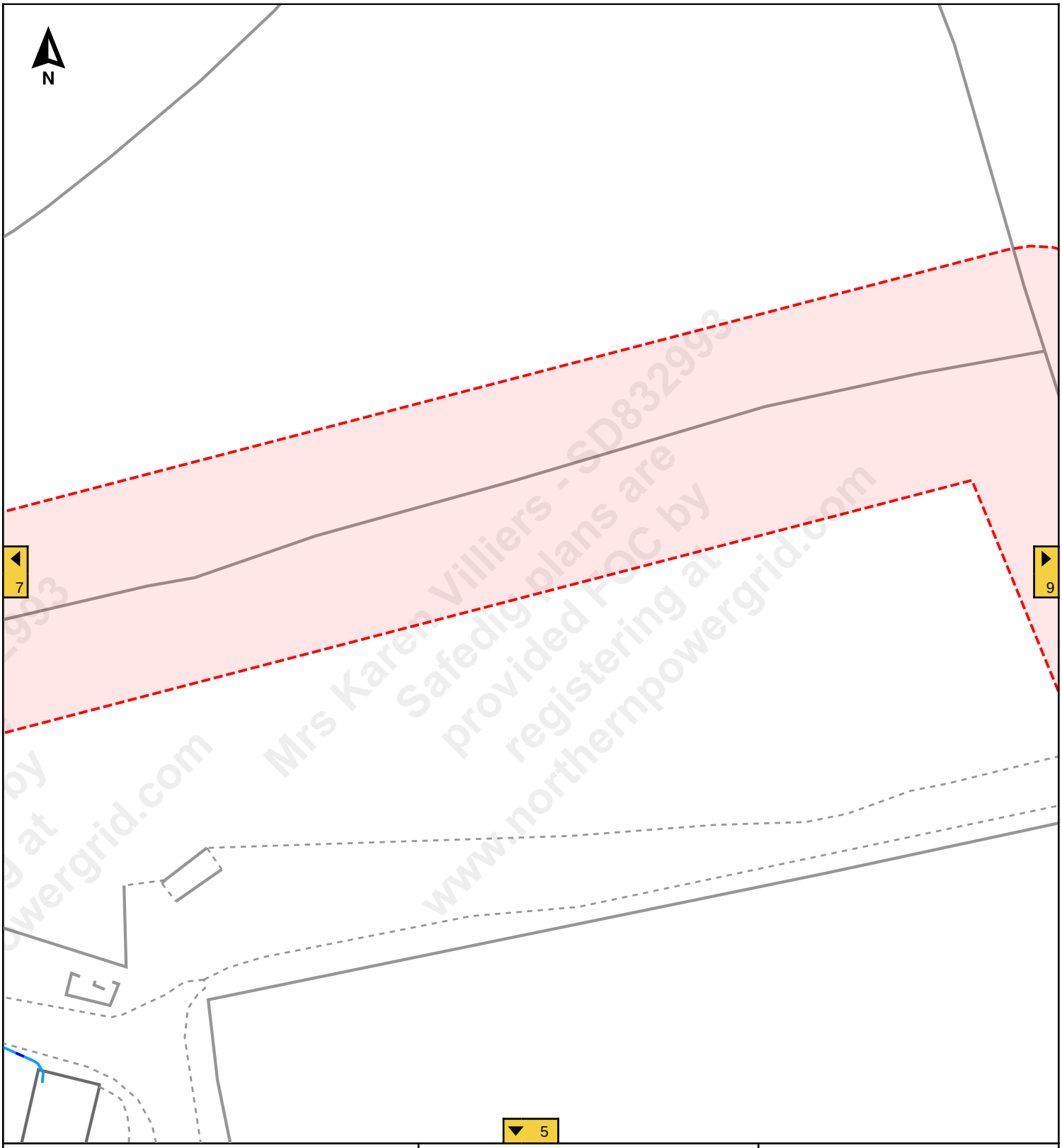
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Persons using it are reminded of their responsibility to execute works safely to avoid damaging Northern Powergrid\'s apparatus.

Further advice or assistance is available from the Records Information Centre on 0191 2294296
In an emergency or outside normal working hours contact our customer information centre on 0800 668877
Cable depths shown were correct at the time cables were laid however alterations to ground levels or cable disposition may have taken place.

Legend:

Underground Cables:

- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

Overhead Conductors:

- 132kV
- 66kV
- 33kV
- 25kV
- LV Mains
- LV Service
- 20kV
- 11kV
- 6kV
- 3kV
- Aux

0 5 10 15 20m

NORTHERN POWERGRID

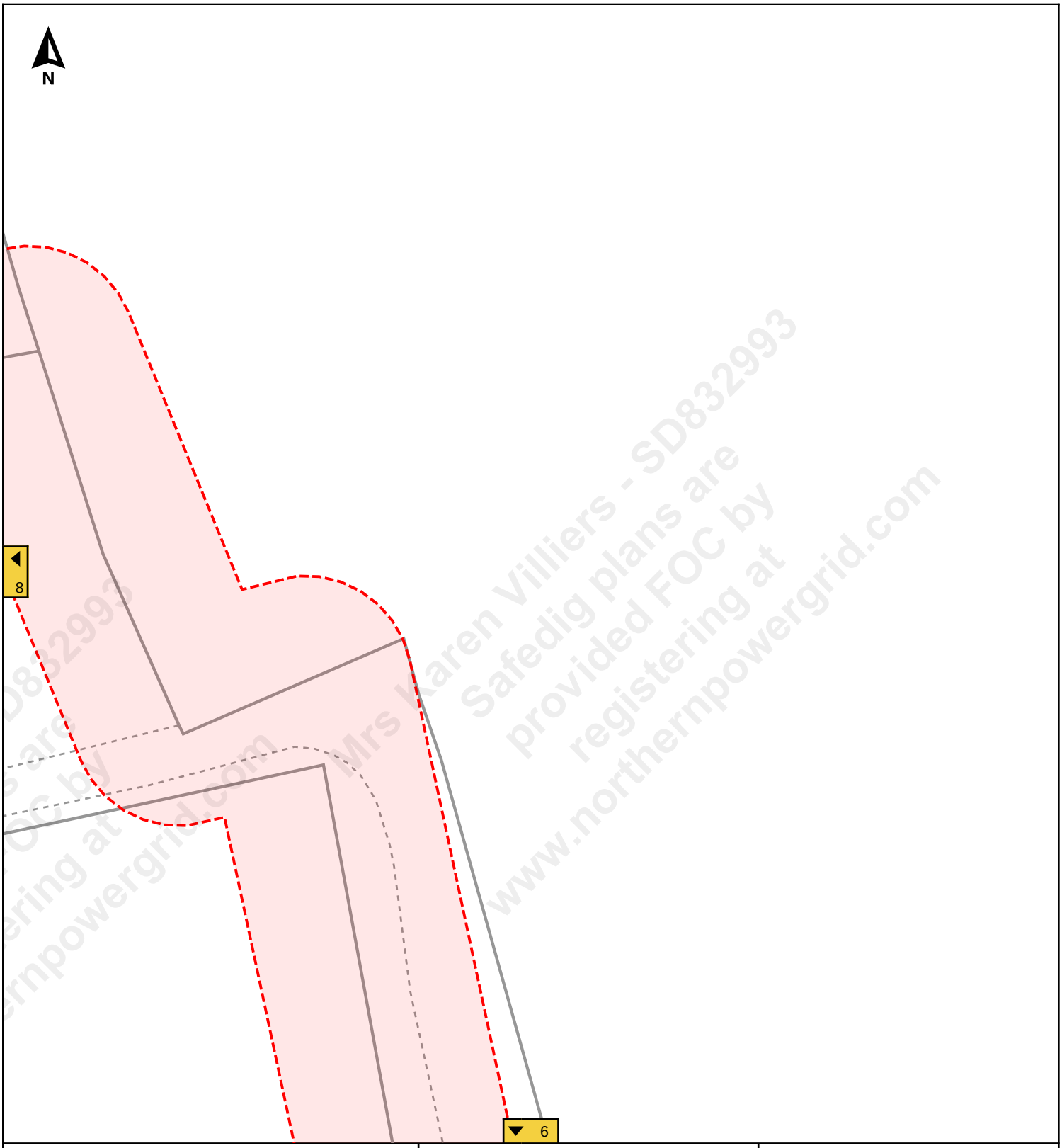
Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419769 428810

Produced For :
Mrs Karen Villiers



Mrs Karen Villiers - SD832993
Safedig plans are provided FOC by registering at www.northernpowergrid.com

Terms and Conditions

Electric cables and/or overhead line information shown on the record plans are to be used in accordance with the Health & Safety Executive's Booklet HS(G)47, "Avoiding Danger from Underground Services" and Guidance Note GS 6, "Avoidance of Danger from Overhead Electric Lines".
Record plans do not always show out of commission cables or service cables from Northern Powergrid\'s mains to adjoining or cross road properties.
Plans do not show local authority owned public lighting or sign cables. The information is provided as a service by NorthernPowergrid and does not impart any legal obligation on their part.
Persons using it are reminded of their responsibility to execute works safely to avoid damaging Northern Powergrid\'s apparatus.

Further advice or assistance is available from the Records Information Centre on 0191 2294296
In an emergency or outside normal working hours contact our customer information centre on 0800 668877
Cable depths shown were correct at the time cables were laid however alterations to ground levels or cable disposition may have taken place.

Legend:

Underground Cables:

- 132kV
- 66kV
- 33kV
- 25kV
- Left In Situ
- LV Mains
- LV Service Assumed Route
- LV Service Logical Connection
- Duct Route
- 20kV
- 11kV
- 6kV
- 3kV
- Aux
- LV Service

Overhead Conductors:

- 132kV
- 66kV
- 33kV
- 25kV
- LV Mains
- LV Service
- 20kV
- 11kV
- 6kV
- 3kV
- Aux

0 5 10 15 20m

NORTHERN POWERGRID

Job Reference : SD832993
STU5725

Scale : 1:500

Date : 18/05/2022

Grid Coordinates : 419863 428810

Produced For :
Mrs Karen Villiers

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Appendix C Exploratory hole records

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Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sample/core recovery' columns

Test result	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m^2) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m^2). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.
	SPT – Standard Penetration Test result (N value) (uncorrected)[1,2,3] SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected)[1,2,3]
	UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample

Sample/core recovery	
Run No.	Records depth and number of the abstracted core[3]
Total Core Recovery (TCR) %	Ratio of core recovered (solid and non-intact) to length of core run
Solid Core Recovery (SCR) %	Ratio of solid, cylindrical, pieces of rock core recovered to length of core run
Rock Quality Designation (RQD) %	Ratio of core pieces longer than 100mm to length of core run
Fracture Index (FI)	Inverse of fracture spacing, per metre, over arbitrary length

Note 1: Seating blows recorded in brackets.

Note 2: Casing depth records depth of casing.

Note 3: The depths of open holing will be recorded in the notes. Method of lubrication of and diameter of drilling tools will be recorded on the log, together with location of circulation loss during drilling.

Water observations

Described at foot of log and shown in the 'water strike' column.

Water level observed after specified delay in drilling

Water strike

Installation details

	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Made Ground (MADE GROUND)																		
	Brown CLAY. (GLACIAL TILL)	0.80																	
	Light grey weathered MUDSTONE. (PENNINE LOWER COAL MEASURES)	4.00																	
		8.70																	

CONTINUED ON NEXT SHEET

Notes	Title		Date(s)
	Borehole record		08/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 4
Groundwater observations Groundwater strike at 13m depth.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH01**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	VOID																		
		9.50																	
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)																		

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 08/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 4
Groundwater observations Groundwater strike at 13m depth.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH01**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 08/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 3 of 4
Groundwater observations Groundwater strike at 13m depth.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH01**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	BOREHOLE TERMINATED AT 30.00m	30.00																	

Notes	Title		Date(s)
	Borehole record		08/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 4 of 4
Groundwater observations Groundwater strike at 13m depth.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH01**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Hardcore (MADE GROUND)	0.30																	
	Brown CLAY. (GLACIAL TILL)																		
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	3.40																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 09/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH02**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	BOREHOLE TERMINATED AT 10.00m	10.00																	

Notes	Title		Date(s)
	Borehole record		09/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH02**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Made Ground (MADE GROUND)																		
	Brown CLAY. (GLACIAL TILL)	3.00																	
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	7.50																	
	COAL (PENNINE LOWER COAL MEASURES)	8.20																	
		8.70																	

CONTINUED ON NEXT SHEET

Notes

Groundwater observations
Groundwater strikes at depths of 6m and 21m.

Title
Borehole record

Date(s)
08/09/2022 - 09/09/2022

Method
Rotary open hole

Logged by
JT

Sheet number
Sheet 1 of 4

Level (m OD)
-

Compiled by
AM

Revision
0

Co-ordinates
-

Checked by
SCD

RBH03

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)																		

CONTINUED ON NEXT SHEET

Notes	Title		Date(s)
	Borehole record		08/09/2022 - 09/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 4
Groundwater observations Groundwater strikes at depths of 6m and 21m.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH03**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
					▼														

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 08/09/2022 - 09/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 3 of 4
Groundwater observations Groundwater strikes at depths of 6m and 21m.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH03**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	BOREHOLE TERMINATED AT 30.00m	30.00																	

Notes	**Title** Borehole record	**Date(s)** 08/09/2022 - 09/09/2022
	Method Rotary open hole	**Logged by** JT
		Sheet number Sheet 4 of 4
Groundwater observations Groundwater strikes at depths of 6m and 21m.	**Level (m OD)** -	**Compiled by** AM
		Revision 0
	Co-ordinates -	**Checked by** SCD
		RBH03

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Made Ground (MADE GROUND)																		
	Brown CLAY. (GLACIAL TILL)	3.50																	
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	5.50																	
	COAL (PENNINE LOWER COAL MEASURES)	8.20 8.40																	

CONTINUED ON NEXT SHEET

Notes

Groundwater observations
Groundwater strike at 21.3m depth.

Title Borehole record		**Date(s)** 09/09/2022
Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 4
Level (m OD) -	**Compiled by** AM	**Revision** 0
Co-ordinates -	**Checked by** SCD	**RBH04**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)																		
	COAL (PENNINE LOWER COAL MEASURES)	12.60																	
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	13.80																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 09/09/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 4
Groundwater observations Groundwater strike at 21.3m depth.	**Level (m OD)** -	**Compiled by** AM	**Revision** 0
	Co-ordinates -	**Checked by** SCD	**RBH04**

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INSTALL	STRATA			WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Yellow/orange SANDSTONE. (PENNINE LOWER COAL MEASURES)	21.30																
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	24.00																
	Yellow SANDSTONE. (PENNINE LOWER COAL MEASURES)	25.50																

CONTINUED ON NEXT SHEET

Notes

Groundwater observations
Groundwater strike at 21.3m depth.

Title
Borehole record

Date(s)
09/09/2022

Method
Rotary open hole

Logged by
JT

Sheet number
Sheet 3 of 4

Level (m OD)
-

Compiled by
AM

Revision
0

Co-ordinates
-

Checked by
SCD

RBH04

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Light grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	27.80																	
	BOREHOLE TERMINATED AT 30.00m	30.00																	

Notes	**Title** Borehole record	**Date(s)** 09/09/2022
	Method Rotary open hole	**Logged by** JT
		Sheet number Sheet 4 of 4
Groundwater observations Groundwater strike at 21.3m depth.	**Level (m OD)** -	**Compiled by** AM
	Co-ordinates -	**Checked by** SCD
		RBH04

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	MADE GROUND (MADE GROUND)																		
	Light grey SILTSTONE (PENNINE LOWER COAL MEASURES)	5.40																	
	Brown MUDSTONE (PENNINE LOWER COAL MEASURES)	6.80																	
		8.60																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH101**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grey MUDSTONE (PENNINE LOWER COAL MEASURES)																		
	Light brown SANDSTONE (PENNINE LOWER COAL MEASURES)	12.80																	
	BOREHOLE TERMINATED AT 15.00m	15.00																	

Notes	**Title** Borehole record	**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT
		Sheet number Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA
		Revision A
	Co-ordinates -	**Checked by** SCD
		RBH101

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	MADE GROUND (MADE GROUND)																		
	...from 3.2m depth, becoming brown.																		
	Light grey SILTSTONE (PENNINE LOWER COAL MEASURES)	4.10																	
	Brown MUDSTONE (PENNINE LOWER COAL MEASURES)	7.20																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH102**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grey MUDSTONE (PENNINE LOWER COAL MEASURES)	9.40																	
	Light brown SANDSTONE (PENNINE LOWER COAL MEASURES)	12.90																	
	BOREHOLE TERMINATED AT 15.00m	15.00																	

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH102**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	MADE GROUND (MADE GROUND)																		
	...from 2.9m depth, becoming brown.																		
	Light grey SILTSTONE. (PENNINE LOWER COAL MEASURES)	3.80																	
	Brown MUDSTONE. (PENNINE LOWER COAL MEASURES)	7.50																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH103**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	9.50																	
	Light brown SILTSTONE. (PENNINE LOWER COAL MEASURES)	13.20																	
	BOREHOLE TERMINATED AT 15.00m	15.00																	

Notes	**Title** Borehole record	**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT
		Sheet number Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA
		Revision A
	Co-ordinates -	**Checked by** SCD
		RBH103

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Dark brown CLAY (GLACIAL TILL) Light brown and grey SILTSTONE with occasional sandstone inclusions. (PENNINE LOWER COAL MEASURES)	0.20																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH104**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	VOID.	9.60																	
	Grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	11.10																	
	Light brown SANDSTONE. (PENNINE LOWER COAL MEASURES)	14.10																	
	BOREHOLE TERMINATED AT 15.00m	15.00																	

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH104**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Dark brown CLAY (GLACIAL TILL) *...from 0.3m depth, becoming brown.*																		
	Light brown and grey SILTSTONE with occasional sandstone inclusions. (PENNINE LOWER COAL MEASURES)	0.90																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH105**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	VOID.	9.10																	
	Grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	10.10																	
	Light brown SANDSTONE. (PENNINE LOWER COAL MEASURES)	13.80																	
	BOREHOLE TERMINATED AT 15.00m	15.00																	

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH105**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Dark brown CLAY (GLACIAL TILL)																		
	Light grey SILTSTONE and SANDSTONE. (PENNINE LOWER COAL MEASURES)	4.20																	
	Brown MUDSTONE. (PENNINE LOWER COAL MEASURES)	7.70																	

CONTINUED ON NEXT SHEET

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 1 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH106**

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INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grey MUDSTONE. (PENNINE LOWER COAL MEASURES)	10.10																	
	Light brown SANDSTONE. (PENNINE LOWER COAL MEASURES)	12.80																	
	BOREHOLE TERMINATED AT 14.00m	14.00																	

Notes	**Title** Borehole record		**Date(s)** 18/11/2022
	Method Rotary open hole	**Logged by** JT	**Sheet number** Sheet 2 of 2
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** SA	**Revision** A
	Co-ordinates -	**Checked by** SCD	**RBH106**

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Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.

Sampling		
From (m) To (m)	Records depth of sampling	
Type	D	Disturbed sample
	B	Bulk disturbed sample
	ES	Environmental sample
	W	Water sample
	U	Undisturbed thick-walled sample 100mm diameter sampler
	UT	Undisturbed thin walled sample 100mm diameter sampler
	UTF	Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

▼ Water level observed after specified delay in drilling

▽ Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown gravelly clayey medium to coarse SAND. Gravel is medium to coarse subangular brick. (TOPSOIL - MADE GROUND)									
	0.20								
Soft grey very gravelly CLAY. Gravel is fine to medium angular coal and brick. (MADE GROUND)							0.50		B
							0.50		D
							1.00		D
							1.50		B
							1.50		D
	2.00								
TRIAL PIT TERMINATED AT 2.00m									

Notes Trial pit sides unstable from 1.8m depth widening pit by 200mm on all sides.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP01**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Stiff orangish brown gravelly slightly sandy CLAY. Gravel is medium subangular mudstone. (GLACIAL TILL)					PP 0.50	PP=150	0.50 0.50		B D
Stiff light brown gravelly slightly sandy CLAY. Gravel is medium to coarse subangular mudstone. (WEATHERED PENNINE LOWER COAL MEASURES)	0.80				PP 0.90	PP=150	0.90 0.90		B D
Light grey sandy clayey medium to coarse subangular GRAVEL of mudstone. (WEATHERED PENNINE LOWER COAL MEASURES)	1.00						1.50 1.50		B D
TRIAL PIT TERMINATED AT 2.00m	2.00								

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations Groundwater encountered at 2.0m depth insufficient to fill base of pit.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP02**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Brown gravelly slightly clayey fine SAND. Gravel is coarse angular brick. (MADE GROUND)							0.30		B
	0.40						0.30		D
Stiff light brown slightly gravelly CLAY. Gravel is medium subangular mudstone. (GLACIAL TILL)					PP 0.70	PP=92	0.70		B
							0.70		D
	1.30						1.30		B
Stiff brown gravelly CLAY. Gravel is medium subangular mudstone. (GLACIAL TILL)					PP 1.40	PP=108	1.30		D
							1.80		B
	2.00						1.80		D
TRIAL PIT TERMINATED AT 2.00m									

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP03**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Firm light brown slightly gravelly slightly sandy CLAY. Gravel is medium to coarse subangular mudstone. (GLACIAL TILL)							0.30 0.30		B D
Stiff light grey gravelly CLAY. Gravel is fine to medium subangular mudstone. (GLACIAL TILL)	1.00				PP 1.00	PP=150	1.00 1.00		B D
					PP 1.60	PP=117	1.60 1.60		B D
Grey slightly clayey coarse subangular GRAVEL of mudstone. (WEATHERED PENNINE LOWER COAL MEASURES)	1.80								
TRIAL PIT TERMINATED AT 2.00m	2.00						2.00 2.00		B D

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP04**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Brown sandy clayey medium to coarse subangular GRAVEL of brick, plastic and coal with frequent angular cobbles of brick and concrete. (MADE GROUND)							0.50 0.50		B D
Stiff orangish brown slightly gravelly CLAY. Gravel is medium to coarse subangular mudstone. (GLACIAL TILL)	1.00				PP 1.50	PP=150	1.50 1.50		B D
Stiff, light brown gravelly CLAY. Gravel is medium subangular mudstone. (GLACIAL TILL)	2.00						2.00 2.00		B D
TRIAL PIT TERMINATED AT 2.30m	2.30				PP 2.30	PP=108			

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP05**

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STRATA				WATER STRIKES	IN SITU TESTING		SAMPLING		
DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
Grass onto brown clayey fine SAND. (TOPSOIL - MADE GROUND)									
	0.30								
Dark brown sandy clayey medium to coarse subangular GRAVEL of mudstone and coal. (MADE GROUND)							1.00 1.00		B D
	1.50				PP 1.50	PP=125	1.50 1.50		B D
Firm brown slightly gravelly slightly sandy CLAY. Gravel is medium subangular mudstone. (GLACIAL TILL)									
	2.00						2.00 2.00		B D
TRIAL PIT TERMINATED AT 2.00m									

Notes Trial pit sides remained upright and stable upon completion.	**Title** Trial pit record	**Dimensions (w x l)** 0.70m x 2.00m	**Date(s)** 18/11/2022
	Method Machine excavator	**Logged by** JT	**Sheet number** Sheet 1 of 1
Groundwater observations No groundwater encountered.	**Level (m OD)** -	**Compiled by** KD	**Revision** A
	Co-ordinates -	**Checked by** JP	**TP06**

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Key to legends

Composite materials, soils and lithology							
	Topsoil		Made Ground		Boulders		Chalk
	Clay		Coal		Cobbles		Concrete
	Gravel		Limestone		Mudstone		Peat
	Sand		Sandstone		Silt		Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		
Depth		Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)
Result		PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m^2) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m^2). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached.
		SPT – Standard Penetration Test result (N value) (uncorrected)[1,2,3] SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected)[1,2,3]
		UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample

Sampling		
From (m) To (m)		Records depth of sampling
Type	D	Disturbed sample
	B	Bulk disturbed sample
	ES	Environmental sample
	W	Water sample
	U	Undisturbed thick-walled sample 100mm diameter sampler
	UT	Undisturbed thin walled sample 100mm diameter sampler
	UTF	Failed undisturbed sample

Water observations

Described at foot of log and shown in the 'water strike' column.

Water level observed after specified delay in drilling

Water strike

Installation details

	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto brown gravelly clayey fine to medium SAND with frequent rootlets. Gravel is fine subangular sandstone. (TOPSOIL)	0.13										0.10		D
	Loose black gravelly medium to coarse SAND. Gravel is medium angular clinker and brick. (MADE GROUND)					S 1.00 - 1.45	(2) 5					1.00		B
	Loose becoming medium dense black and brown gravelly silty fine SAND. Gravel is fine angular coal, clinker and brick. (MADE GROUND)	1.70				S 2.00 - 2.45	(2) 4							
						S 3.00 - 3.45	(5) 14							
						S 4.00 - 4.45	(3) 12							
	Firm becoming stiff brown mottled light grey slightly gravelly CLAY. Gravel is fine angular coal. (GLACIAL TILL)	4.20								PP 4.30	PP=100	4.50		D
										PP 4.60	PP=133			
						S 5.00 - 5.45	(15) 43			PP 4.90	PP=175			
	BOREHOLE TERMINATED AT 5.45m	5.45												

Notes

Groundwater observations
No groundwater encountered.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	95
1.00 - 2.00	40
2.00 - 3.00	40
3.00 - 4.00	45
4.00 - 5.00	95

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS01

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INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly clayey fine to medium SAND with frequent rootlets. Gravel is fine to medium subangular sandstone. (TOPSOIL)											0.10		D
	Stiff friable dark grey gravelly CLAY. Gravel is medium angular coal and sandstone. (MADE GROUND)	0.35								PP 0.50	PP=158			
						S 1.00 - 1.45	(2) 3							
	Loose black very gravelly slightly clayey medium to coarse SAND. Gravel is fine to medium angular clinker, coal and brick. (MADE GROUND)	1.50										1.80		D
						S 2.00 - 2.45	(2) 8							
	Firm becoming stiff light grey mottled dark grey slightly gravelly CLAY. Gravel is fine angular coal. (GLACIAL TILL)	2.80								PP 2.90	PP=25			
						S 3.00 - 3.45	(3) 17							
										PP 3.40	PP=100	3.50		D
										PP 3.70	PP=108			
						S 4.00 - 4.45	(5) 19			PP 4.00	PP=108			
	...between 4.4m and 4.7m depth, becoming black fine SAND (Coal).									PP 4.30	PP=150			
										PP 4.70	PP=167			
						S 5.00 - 5.44	(13) 50/285mm							
	BOREHOLE TERMINATED AT 5.44m	5.44												

Notes

Groundwater observations
No groundwater encountered.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details

Range (m)	Recovery (%)
0.00 - 1.00	100
1.00 - 2.00	50
2.00 - 3.00	30
3.00 - 4.00	80
4.00 - 5.00	95

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS02

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto very gravelly medium to coarse SAND. Gravel is medium subangular clinker, coal and brick. (TOPSOIL)	0.20										0.10		D
	Dark grey gravelly medium to coarse SAND. Gravel is medium subangular clinker, brick and coal. (MADE GROUND)	0.50										0.20		D
	Stiff friable dark grey gravelly CLAY. Gravel is medium to coarse angular coal and sandstone. (MADE GROUND)					S 1.00 - 1.45	(2) 6			PP 0.60 PP 0.90	PP=133 PP=125	0.70		D
	Firm becoming stiff orangish brown mottled grey slightly gravelly CLAY. Gravel is fine to medium subangular sandstone and coal. (GLACIAL TILL)	1.40				S 2.00 - 2.45	(3) 26							
						S 3.00 - 3.44	(7) 50/295mm							
	BOREHOLE TERMINATED AT 3.44m	3.44												

Notes
Borehole terminated at 3m depth due to refusal.

Groundwater observations
No groundwater encountered.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	95
1.00 - 2.00	80
2.00 - 3.00	80

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS03

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	ASPHALT.	0.10										0.10		D
	(ASPHALT)													
	Reddish and yellowish brown sandy clayey medium to coarse subangular to angular GRAVEL of brick and sandstone.	0.40								PP 0.50	PP=150	0.50		D
	(MADE GROUND)													
	Stiff brown slightly gravelly CLAY. Gravel is fine subrounded coal and quartzite.									PP 0.80	PP=150			
	(GLACIAL TILL)					S 1.00 - 1.45	(2) 11							
	Stiff orangish brown mottled grey slightly gravelly CLAY. Gravel is fine subrounded coal.	1.30								PP 1.30	PP=142	1.45		D
	(GLACIAL TILL)									PP 1.60	PP=158			
										PP 1.90	PP=142			
	...between 2m and 2.5m depth, becoming friable.					S 2.00 - 2.45	(3) 10							
										PP 2.20	PP=117			
										PP 2.50	PP=150			
	Very soft light grey gravelly CLAY. Gravel is fine to coarse subangular to angular sandstone and coal.	2.90								PP 2.90	PP=92			
	(GLACIAL TILL)					S 3.00 - 3.45	(4) 26			PP 3.00	PP=0			
	Very stiff friable black and grey gravelly CLAY. Gravel is fine to medium angular coal and sandstone.	3.50										3.80		D
	(WEATHERED PENNINE LOWER COAL MEASURES FORMATION)					S 4.00 - 4.32	(23) 50/170mm							
	BOREHOLE TERMINATED AT 4.32m	4.32												

Notes
Borehole terminated at 4m depth due to refusal.

Groundwater observations
Groundwater encountered at 3.4m depth. Water level remained constant.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	90
1.00 - 2.00	95
2.00 - 3.00	95
3.00 - 4.00	80

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS04

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	ASPHALT. (ASPHALT)	0.14								PP 0.20	PP=83	0.30		D
	Soft to firm brown gravelly CLAY. Gravel is medium to coarse subangular brick and sandstone. (MADE GROUND)	0.70								PP 0.80	PP=150	0.80		D
	Firm orangish brown mottled grey slightly gravelly CLAY. Gravel is fine subangular coal and sandstone. (GLACIAL TILL)					S 1.00 - 1.45	(3) 22			PP 1.10 PP 1.40 PP 1.70	PP=142 PP=192 PP=208			
	Stiff friable orangish brown and light brown gravelly CLAY. Gravel is medium subangular sandstone. (GLACIAL TILL)	2.00				S 2.00 - 2.45 S 3.00 - 3.40	(10) 37 (22) 50/250mm			PP 2.60	PP=158	2.50		D
	BOREHOLE TERMINATED AT 3.40m	3.40												

Notes
Borehole terminated at 3m depth due to refusal.

Groundwater observations
No groundwater encountered.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	90
1.00 - 2.00	95
2.00 - 3.00	90

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS05

East Bierley Sports Community Association
STU5725

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INSTALL	STRATA DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND	WATER STRIKES	SPT TESTING TYPE / DEPTH (m)	SPT TESTING RESULT	SPT TESTING CASING DEPTH (m)	SPT TESTING WATER LEVEL (m)	OTHER IN SITU TESTING TYPE / DEPTH (m)	OTHER IN SITU TESTING RESULT	SAMPLING FROM (m)	SAMPLING TO (m)	SAMPLING TYPE
	Grass onto gravelly fine SAND. Gravel is fine subangular brick and coal. (TOPSOIL)	0.12										0.10		D
	Black and dark brown gravelly medium to coarse SAND. Gravel is medium to coarse angular clinker, brick and sandstone. (MADE GROUND)					S 1.00 - 1.45	(3) 11							
	Stiff friable dark grey gravelly CLAY. Gravel is medium to coarse subangular coal and sandstone. (MADE GROUND)	1.20										1.40		D
	Firm becoming stiff orangish brown mottled reddish grey slightly gravelly CLAY. Gravel is fine subangular coal. (GLACIAL TILL)	1.60								PP 1.50	PP=150			
										PP 1.80	PP=150			
						S 2.00 - 2.45	(2) 9			PP 2.10	PP=92			
										PP 2.30	PP=175			
	Stiff friable dark grey slightly gravelly CLAY. Gravel is fine angular sandstone, coal and mudstone. (WEATHERED PENNINE LOWER COAL MEASURES FORMATION)	2.45								PP 2.60	PP=208			
						S 3.00 - 3.45	(14) 45					3.00		D
						S 4.00 - 4.30	(20) 50/150mm			PP 4.00	PP=92			
	BOREHOLE TERMINATED AT 4.30m	4.30												

Notes

Groundwater observations
No groundwater encountered.

Title
Dynamic windowless sampling record

Date(s)
08/09/2022

Recovery details	
Range (m)	Recovery (%)
0.00 - 1.00	85
1.00 - 2.00	90
2.00 - 3.00	95
3.00 - 4.00	95
4.00 - 5.00	90

Method
Windowless sampler

Logged by
JT

Sheet number
Sheet 1 of 1

Level (m OD)
-

Compiled by
KD

Revision
0

Co-ordinates
-

Checked by
SCD

WS06

Appendix D In situ test results

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Dynamic Cone Penetrometer (DCP) summary

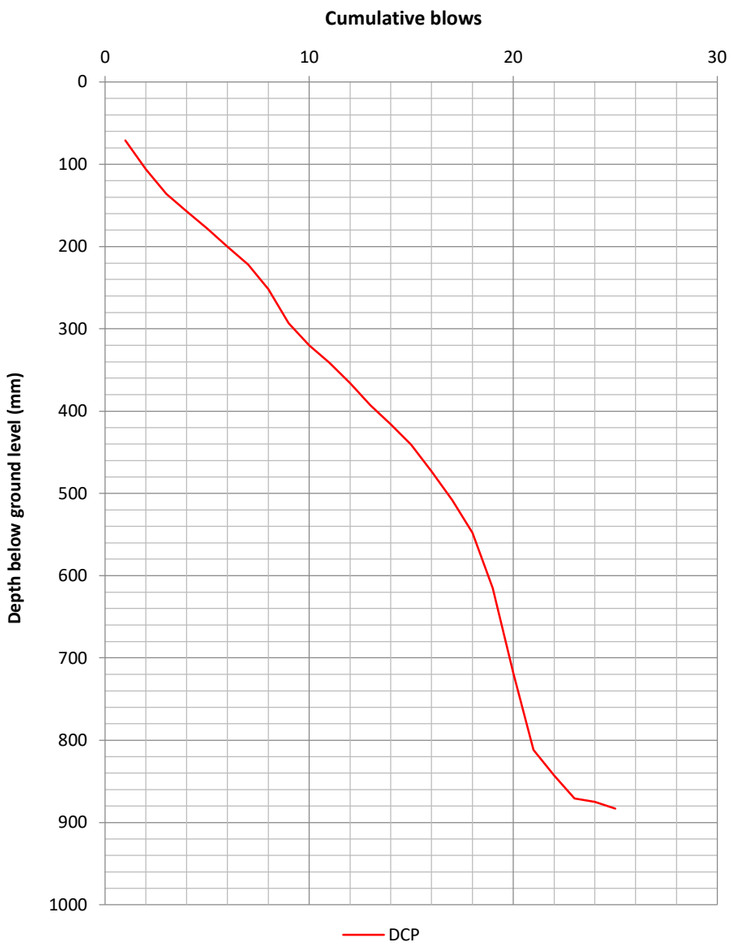
Location	Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
DCP01	1	9.2	415	65	480
DCP01	2	3.4	332	480	812
DCP01	3	8.4	58	812	870
DCP01	4	42.5	13	870	883
DCP02	1	16.6	156	49	205
DCP02	2	6.8	578	205	783
DCP02	3	122.5	54	783	837
DCP03	1	16.1	224	52	276
DCP03	2	44.6	220	276	496
DCP03	3	19.6	306	496	802
DCP03	4	26.8	99	802	901
DCP04	1	9.7	284	15	299
DCP04	2	36.2	134	299	433
DCP04	3	11.8	472	433	905
DCP05	1	20.1	130	31	161
DCP05	2	46.5	176	161	337
DCP05	3	23.7	300	337	637
DCP05	4	9.0	278	637	915
DCP06	1	28.4	159	34	193
DCP06	2	57.2	111	193	304
DCP06	3	28.3	254	304	558
DCP06	4	22.3	376	558	934
DCP07	1	22.4	503	35	538
DCP07	2	64.3	147	538	685
DCP07	3	47.4	150	685	835
DCP08	1	21.3	466	55	521
DCP08	2	36.9	314	521	835
DCP09	1	55.1	80	27	107
DCP09	2	15.5	299	107	406
DCP09	3	39.7	116	406	522
DCP09	4	8.1	398	522	920
DCP10	1	25.6	155	28	183
DCP10	2	22.5	245	183	428
DCP10	3	8.5	470	428	898
DCP11	1	4.0	120	63	183
DCP11	2	18.3	651	183	834
DCP12	1	19.5	120	32	152
DCP12	2	101.7	182	152	334
DCP14	1	13.3	96	24	120
DCP14	2	59.3	98	120	218
DCP14	3	211.6	42	218	260
DCP15	1	27.3	709	30	739
DCP15	2	60.0	60	739	799
DCP15	3	27.5	116	799	915

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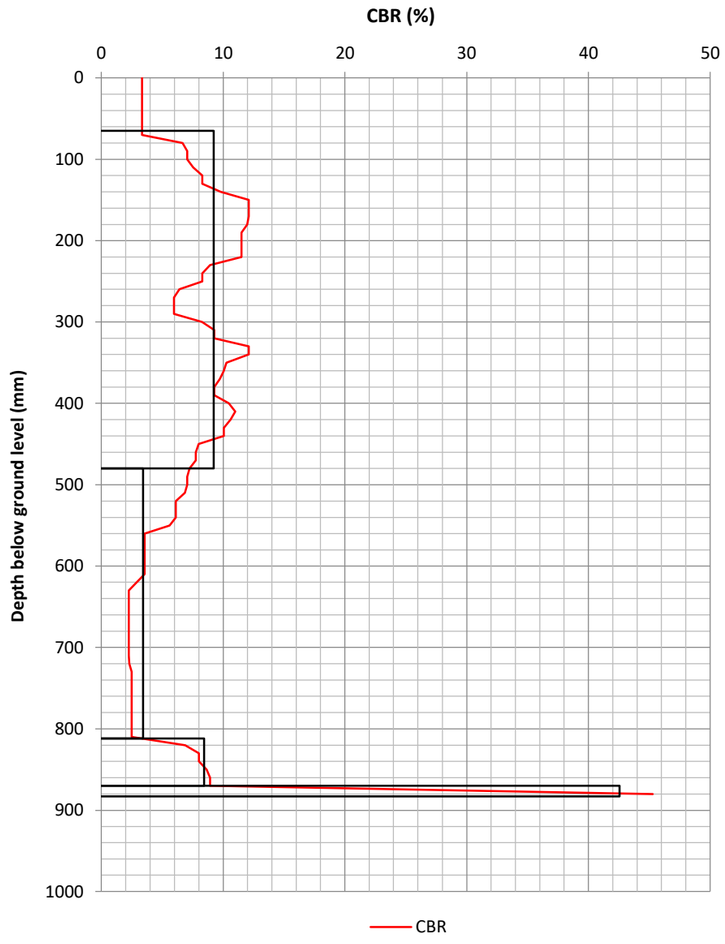
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP01	08/09/2022	0	57	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**9.2**	415	65	480
2	**3.4**	332	480	812
3	**8.4**	58	812	870
4	**42.5**	13	870	883

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

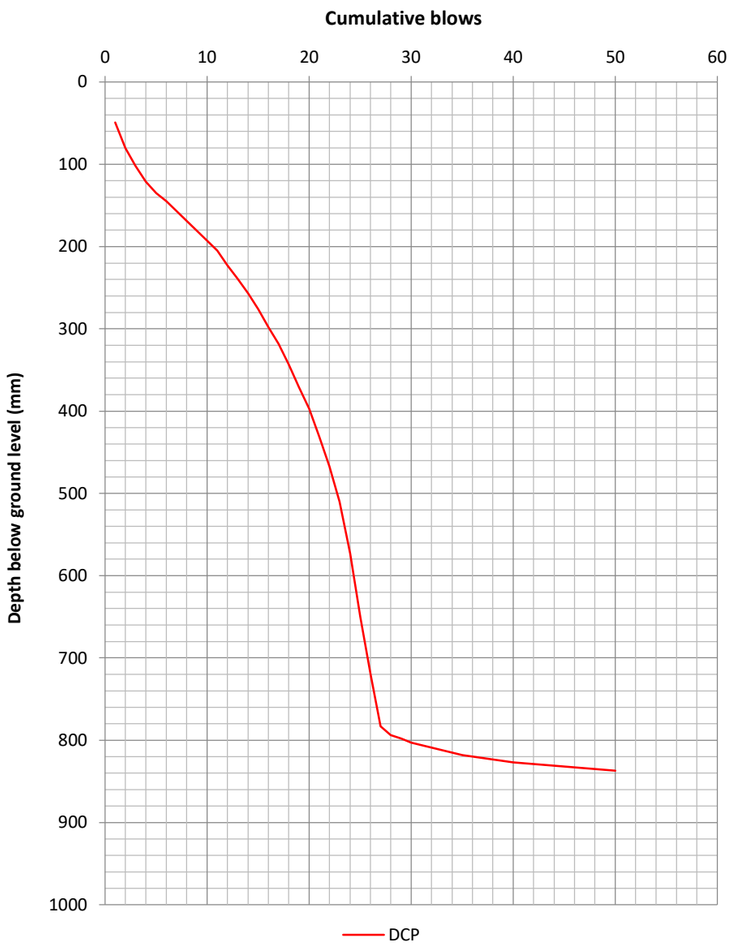
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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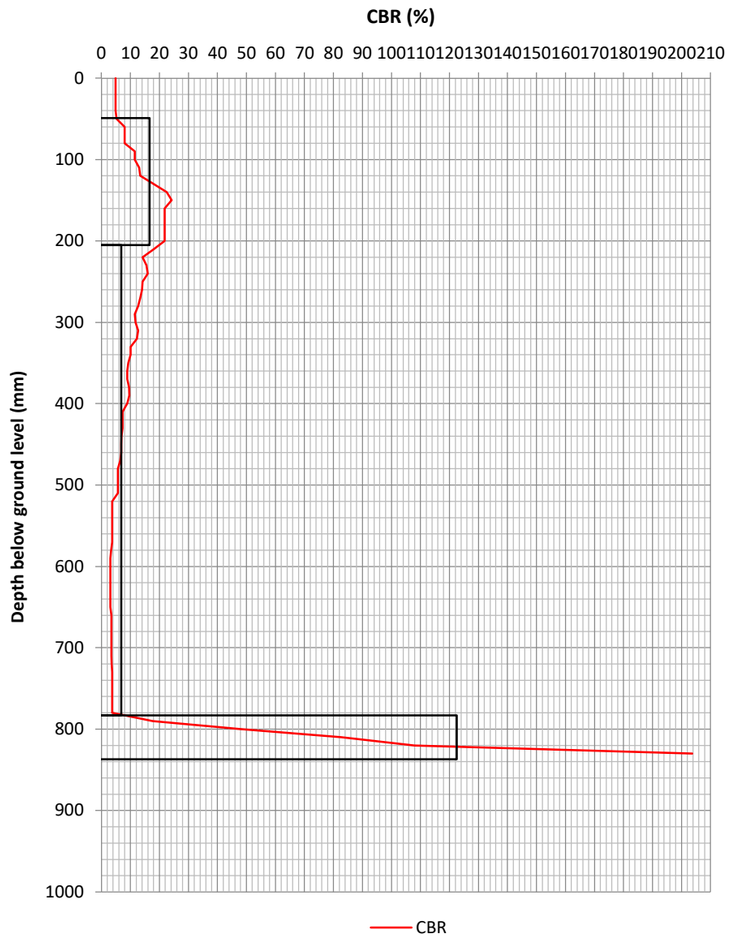
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP02	09/09/2022	0	55	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**16.6**	156	49	205
2	**6.8**	578	205	783
3	**122.5**	54	783	837

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

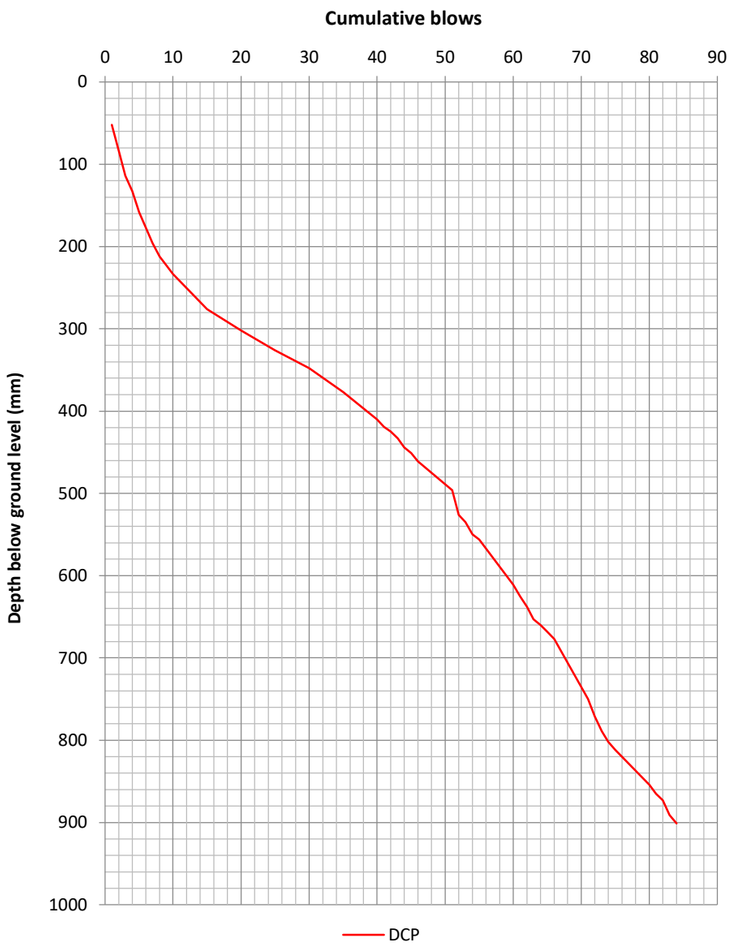
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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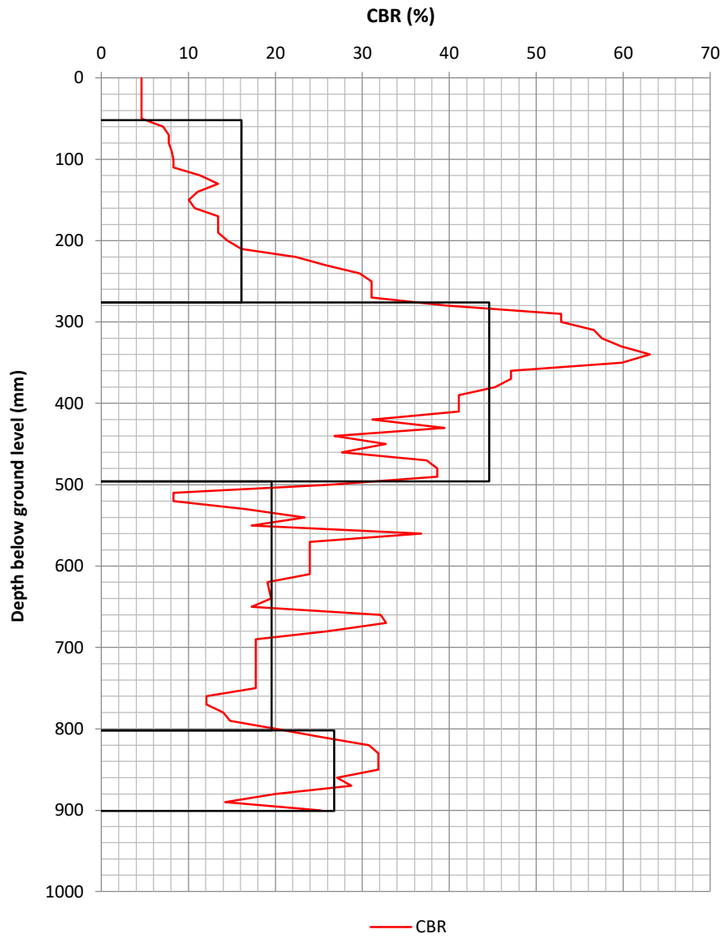
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP03	09/09/2022	0	54	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**16.1**	224	52	276
2	**44.6**	220	276	496
3	**19.6**	306	496	802
4	**26.8**	99	802	901

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

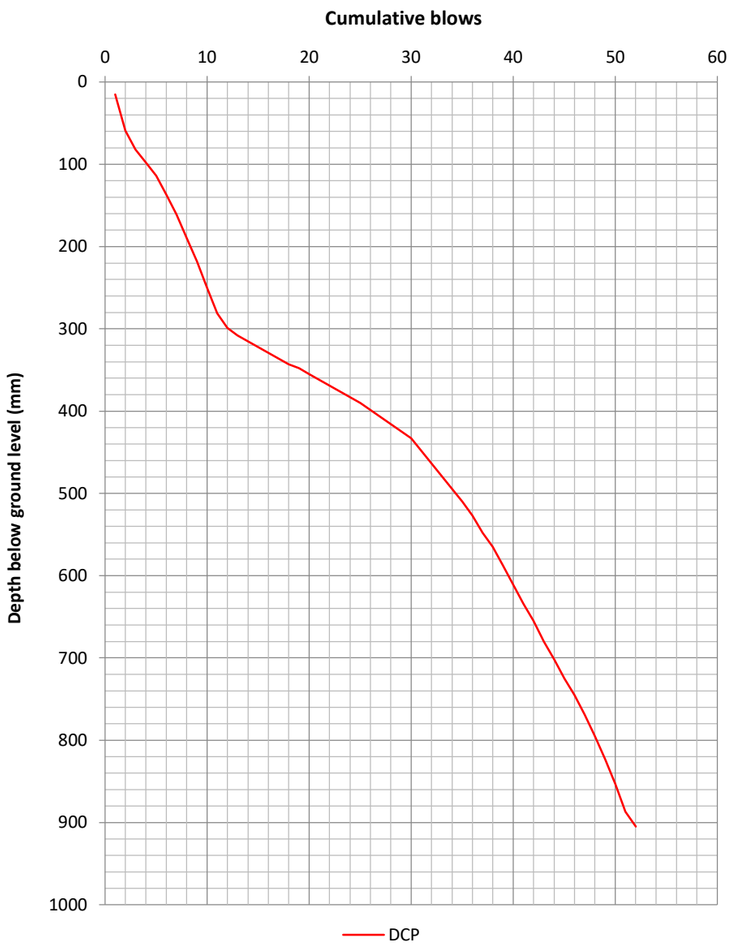
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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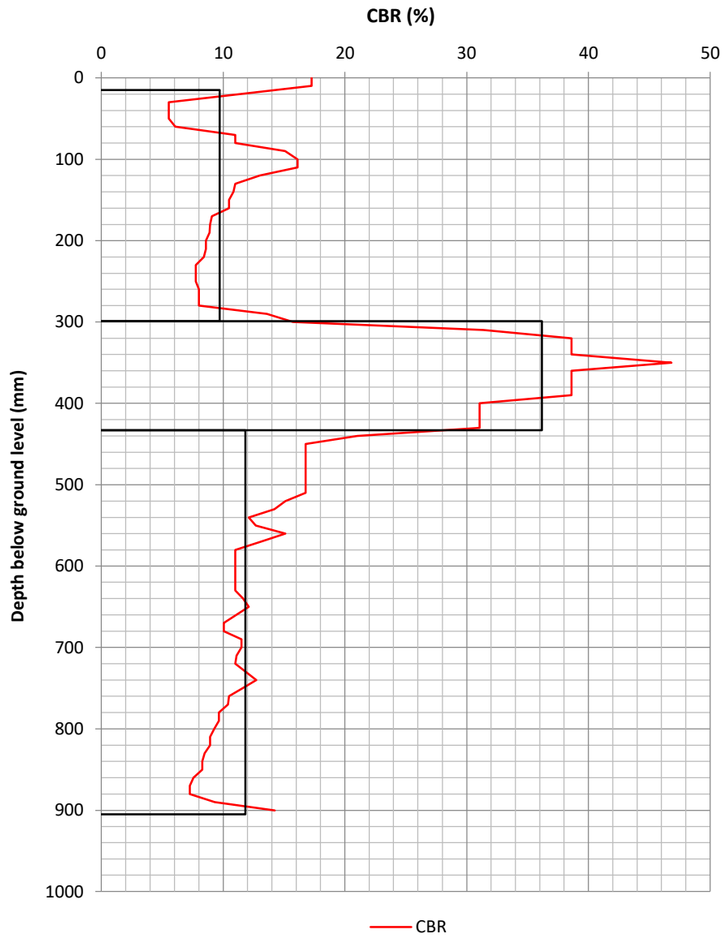
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP04	09/09/2022	0	55	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**9.7**	284	15	299
2	**36.2**	134	299	433
3	**11.8**	472	433	905

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

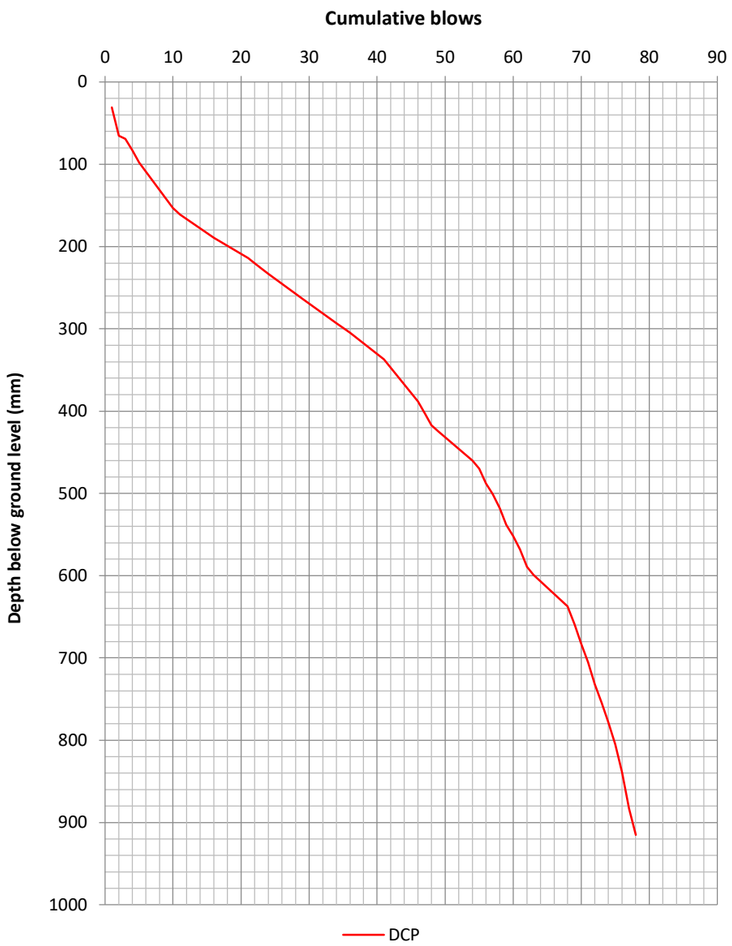
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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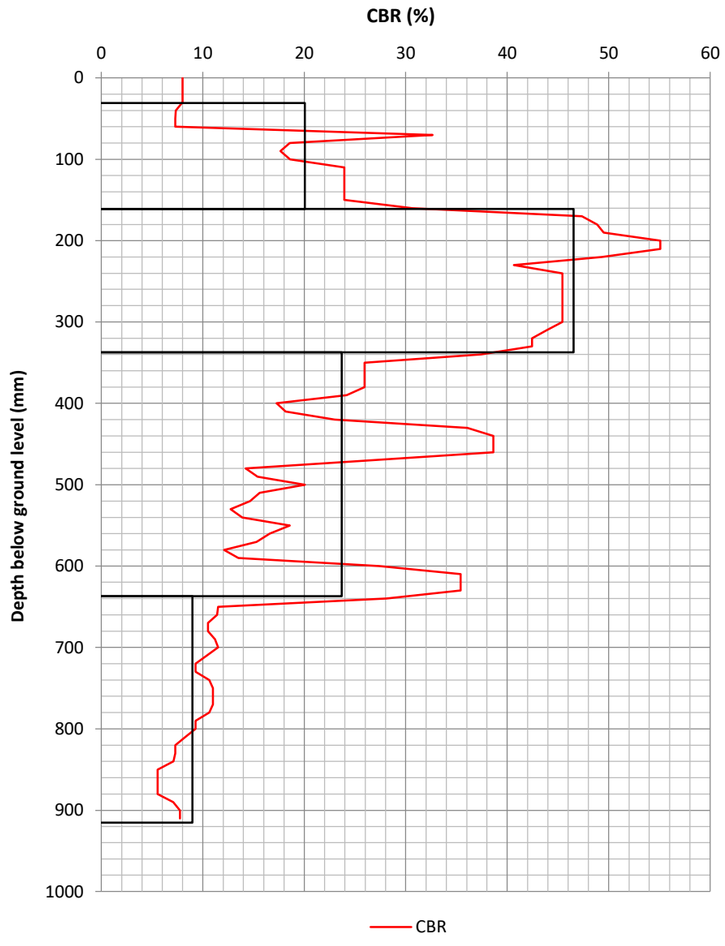
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP05	09/09/2022	0	45	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**20.1**	130	31	161
2	**46.5**	176	161	337
3	**23.7**	300	337	637
4	**9.0**	278	637	915

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

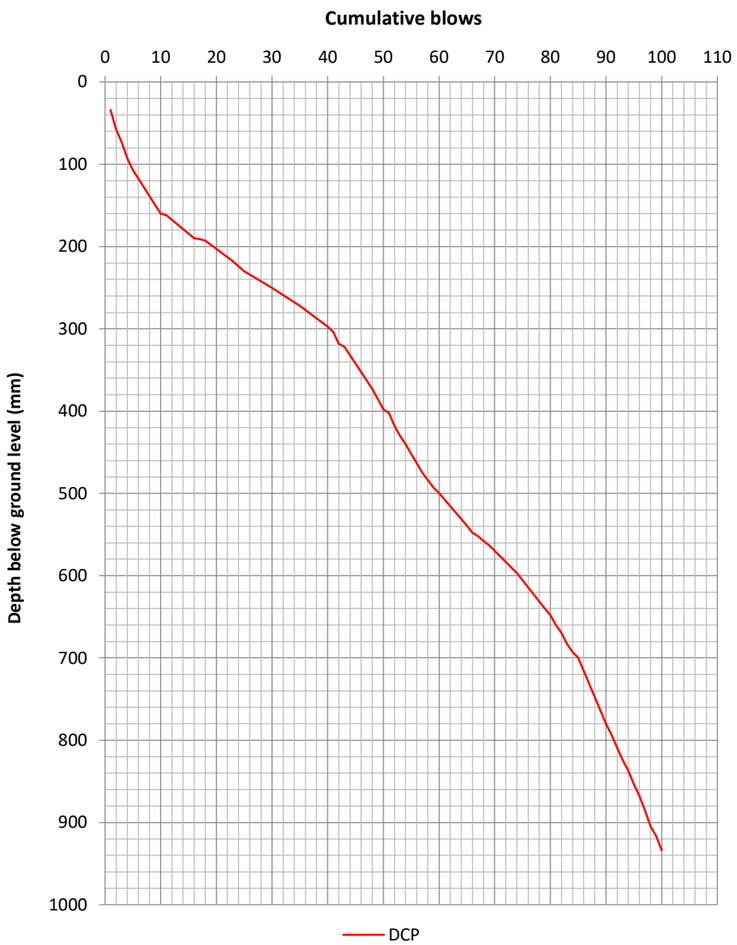
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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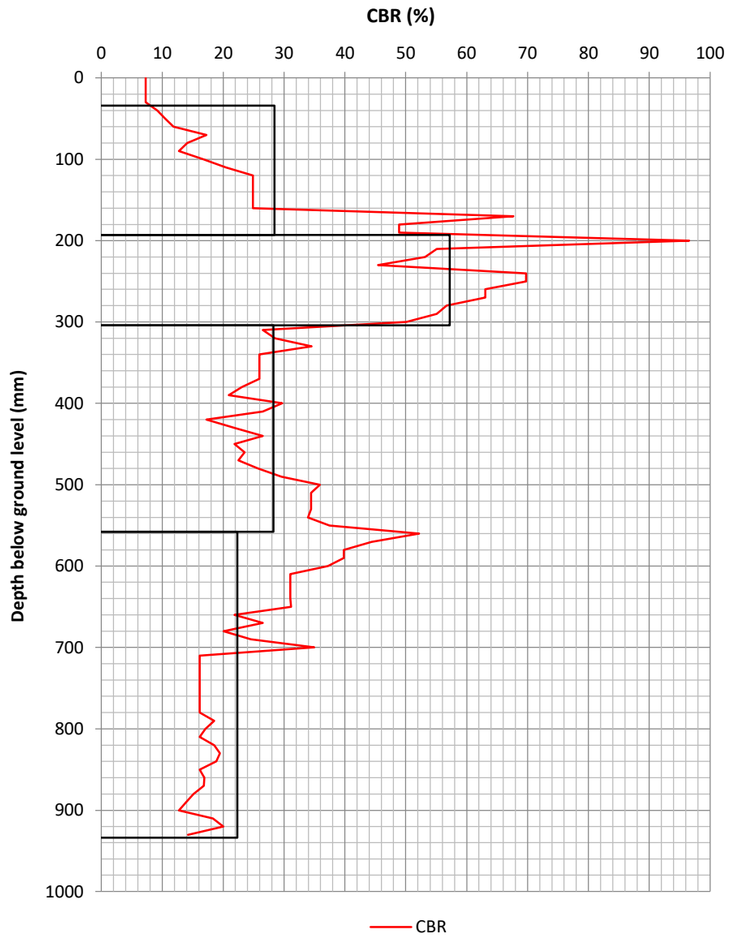
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP06	09/09/2022	0	40	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**28.4**	159	34	193
2	**57.2**	111	193	304
3	**28.3**	254	304	558
4	**22.3**	376	558	934

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

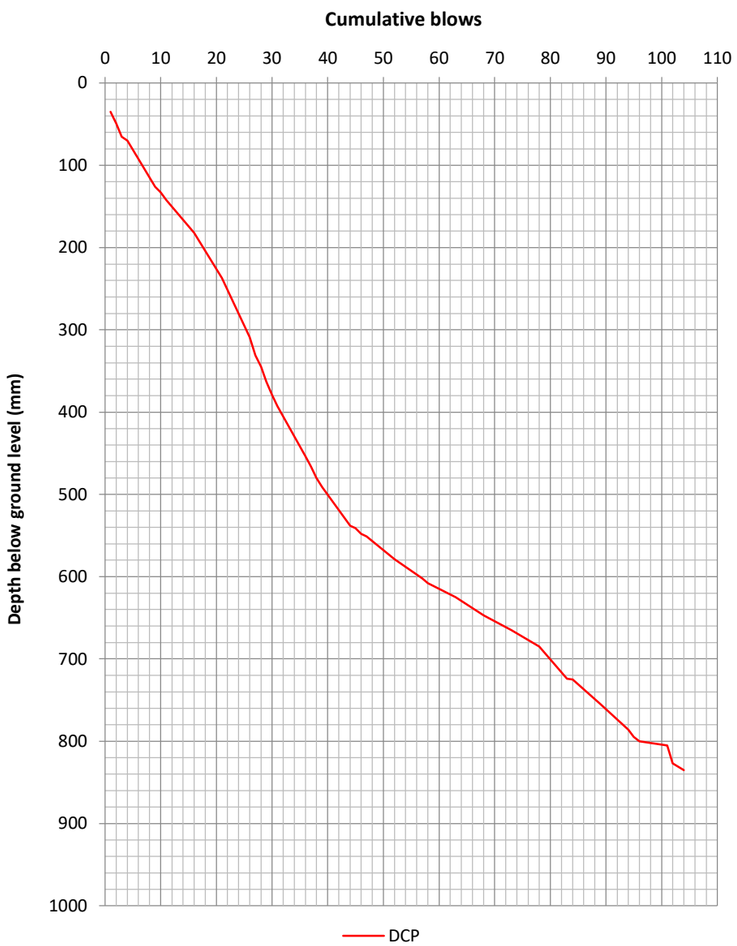
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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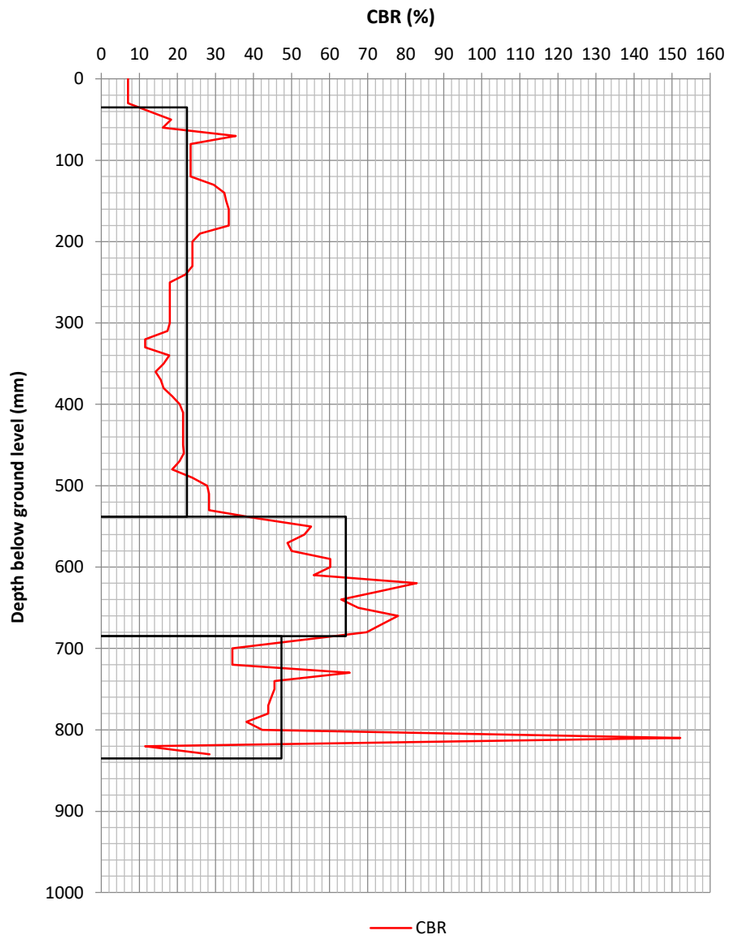
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP07	09/09/2022	0	85	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**22.4**	503	35	538
2	**64.3**	147	538	685
3	**47.4**	150	685	835

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

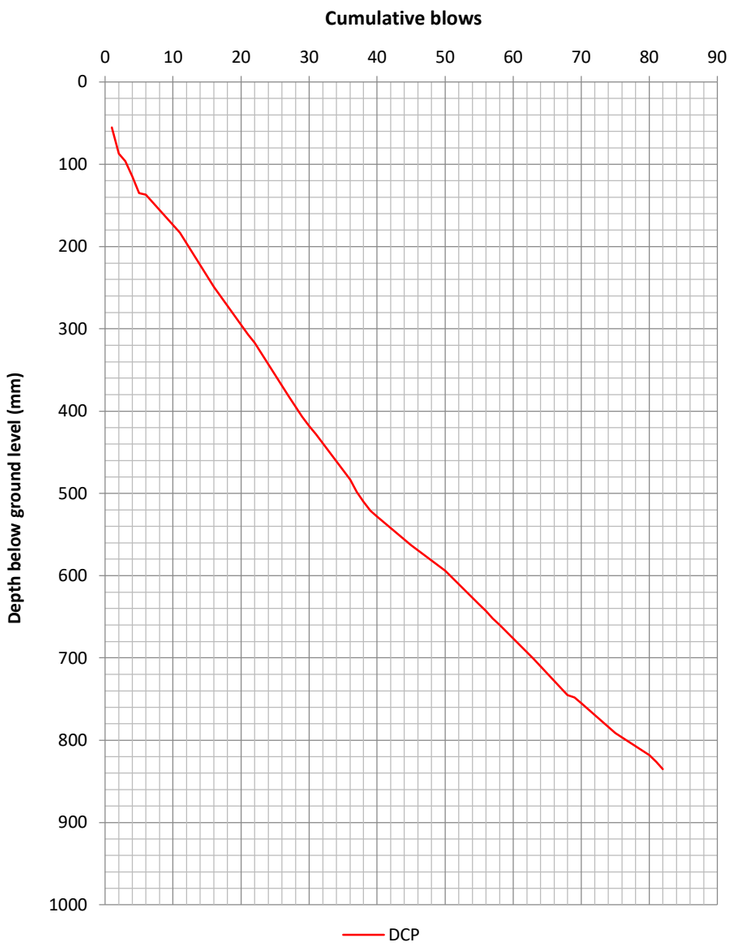
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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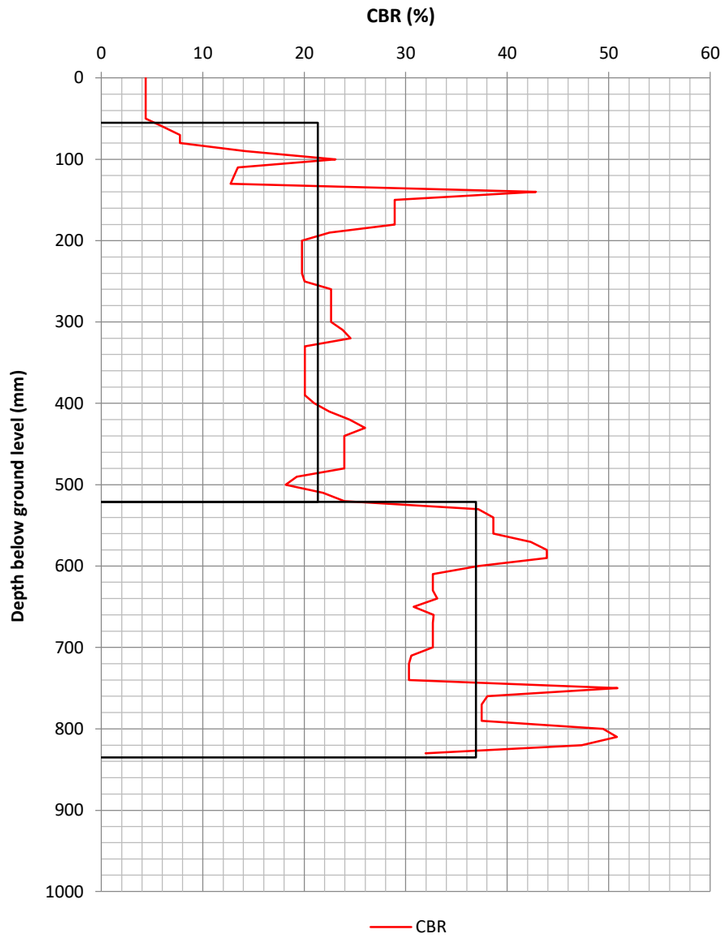
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP08	09/09/2022	0	85	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**21.3**	466	55	521
2	**36.9**	314	521	835

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

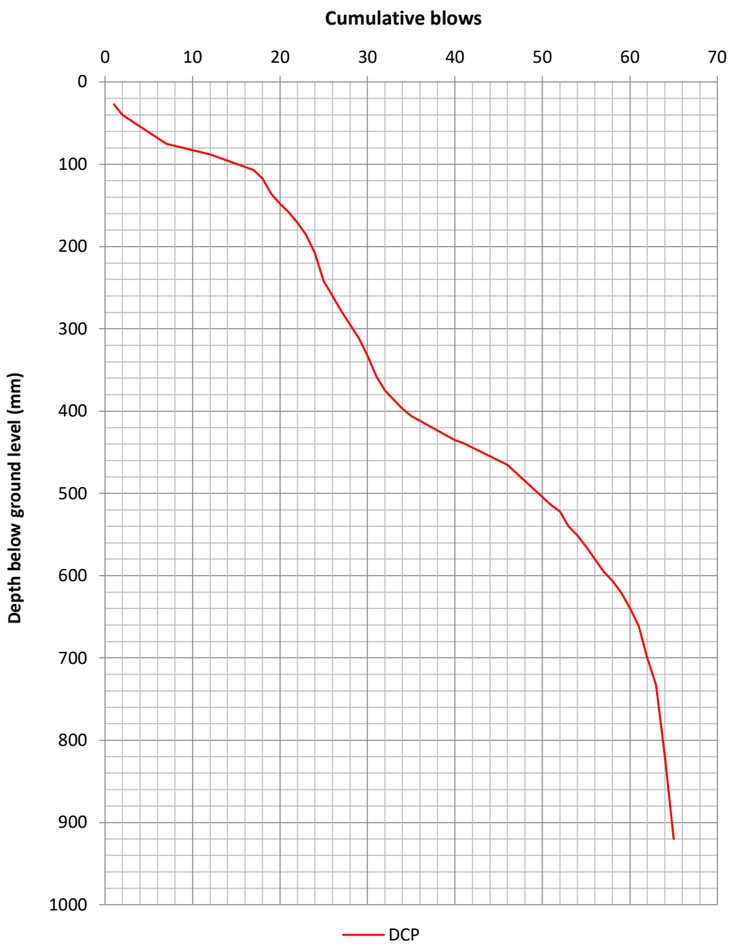
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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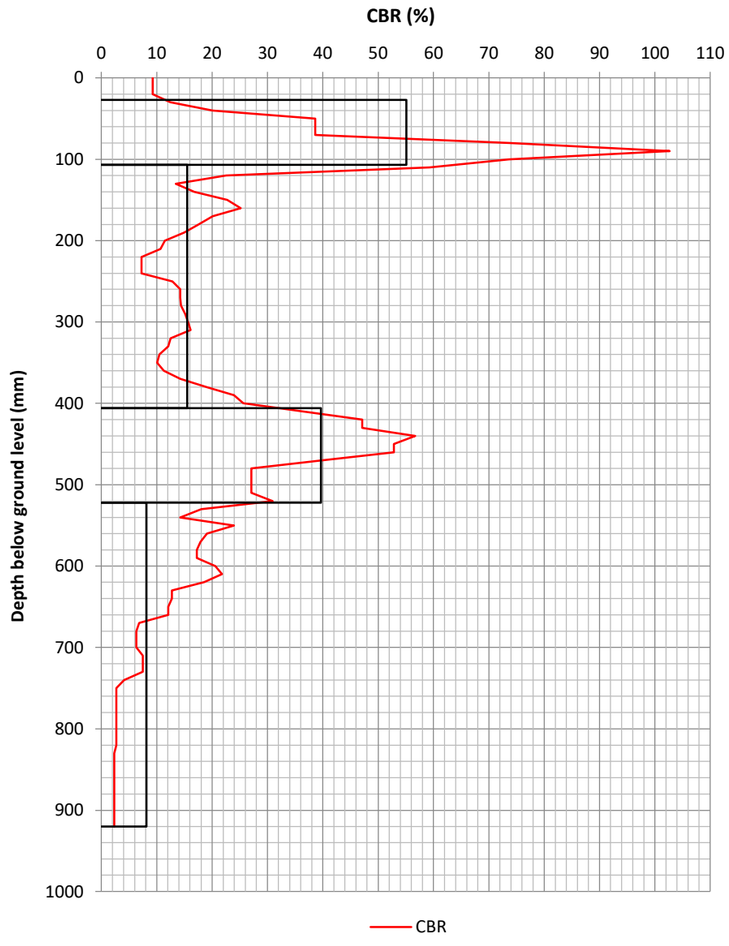
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP09	09/09/2022	0	50	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**55.1**	80	27	107
2	**15.5**	299	107	406
3	**39.7**	116	406	522
4	**8.1**	398	522	920

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

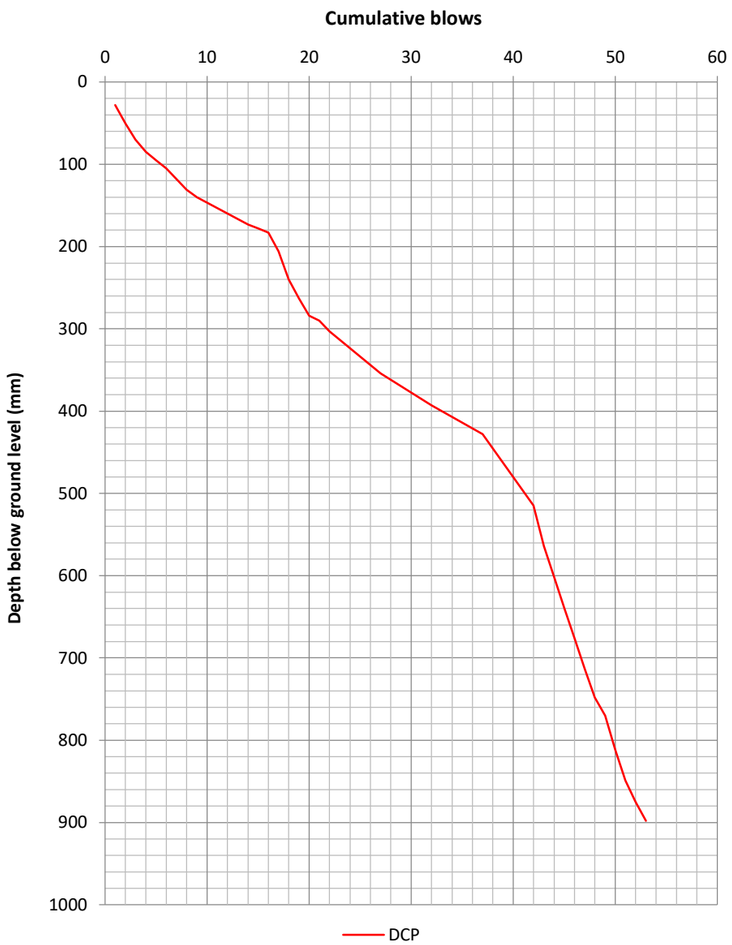
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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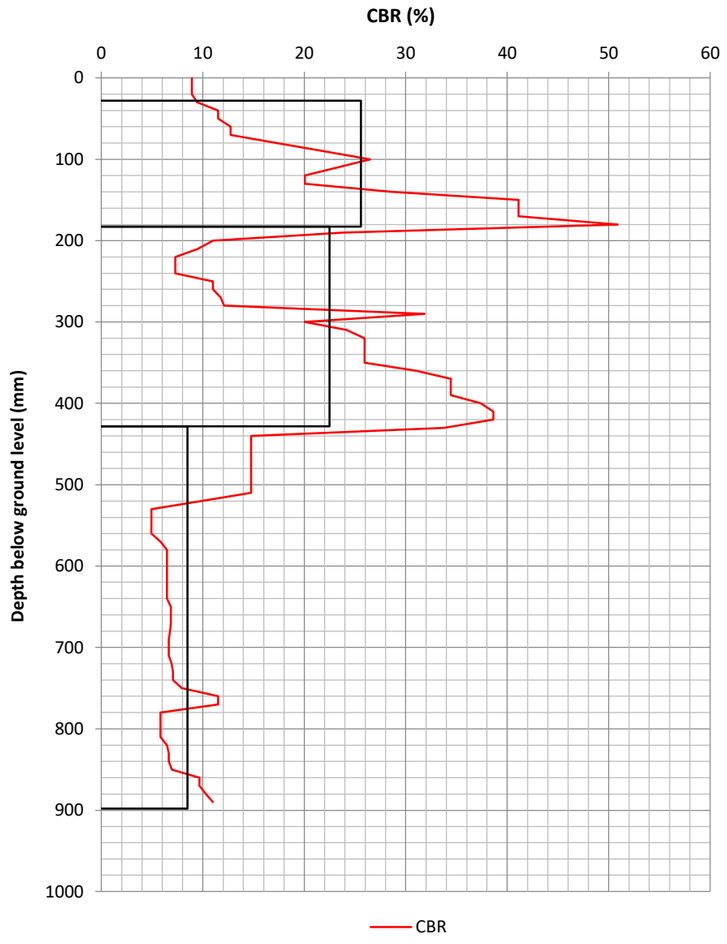
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP10	09/09/2022	0	40	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**25.6**	155	28	183
2	**22.5**	245	183	428
3	**8.5**	470	428	898

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

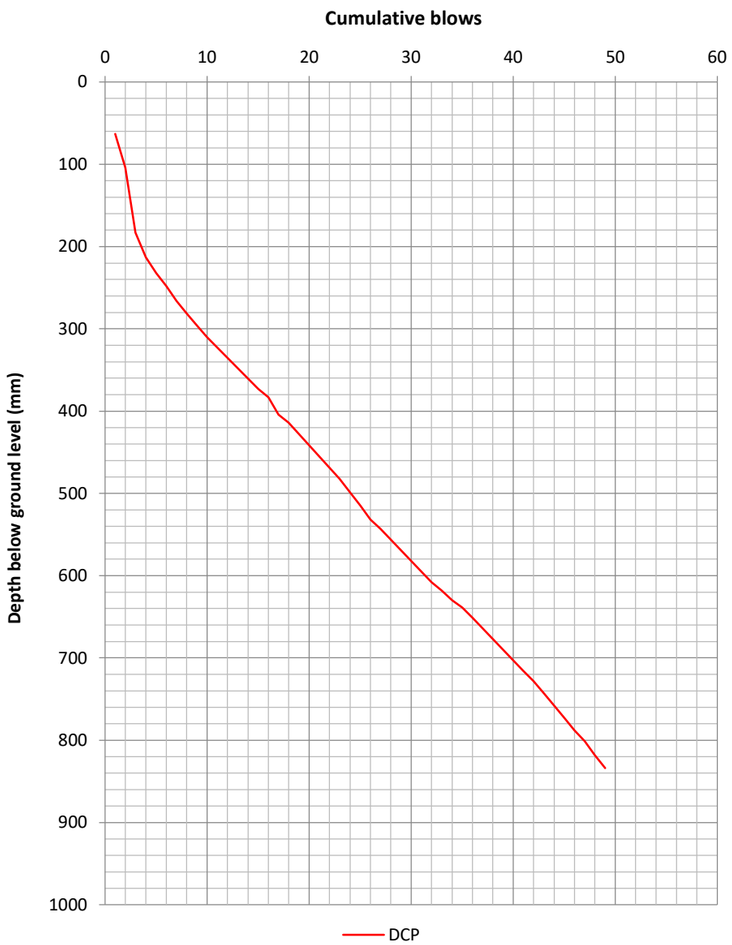
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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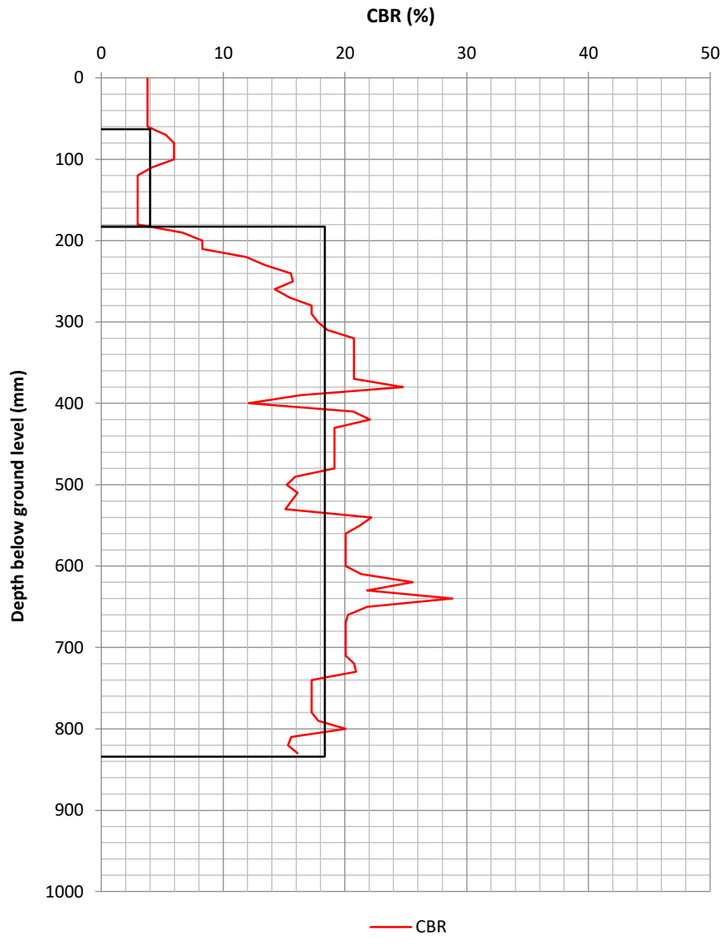
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP11	09/09/2022	0	122	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**4.0**	120	63	183
2	**18.3**	651	183	834

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

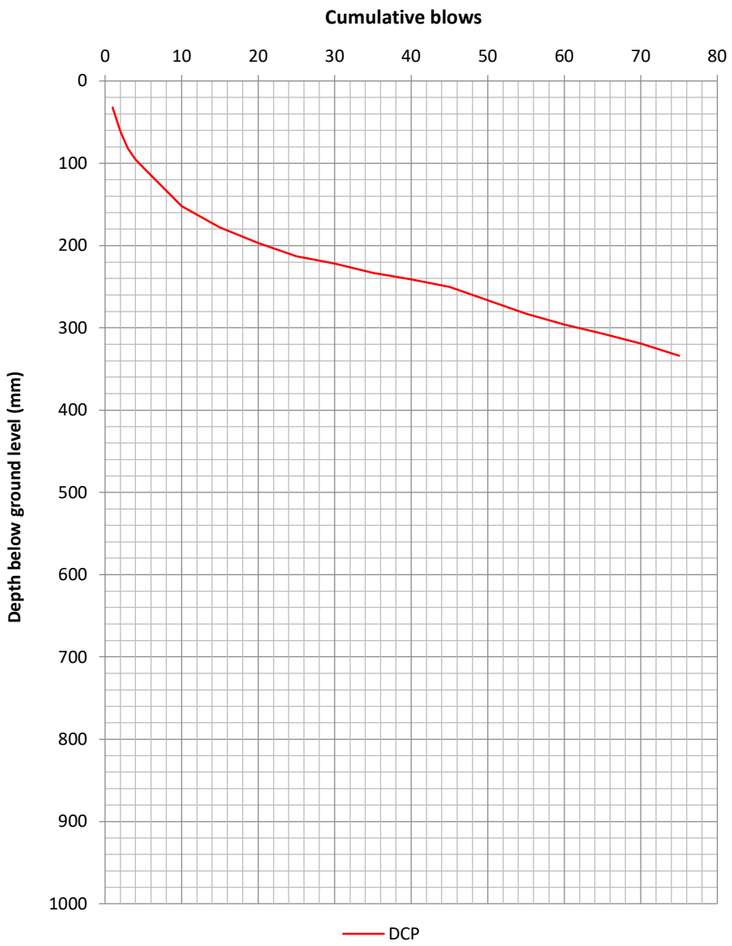
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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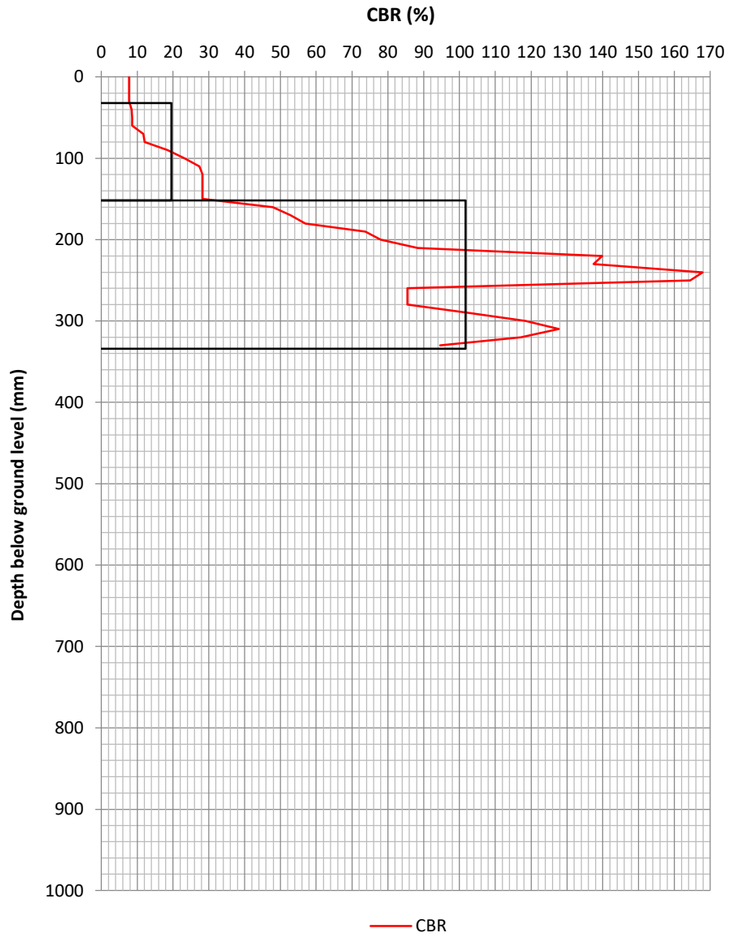
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP12	09/09/2022	0	45	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**19.5**	120	32	152
2	**101.7**	182	152	334

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

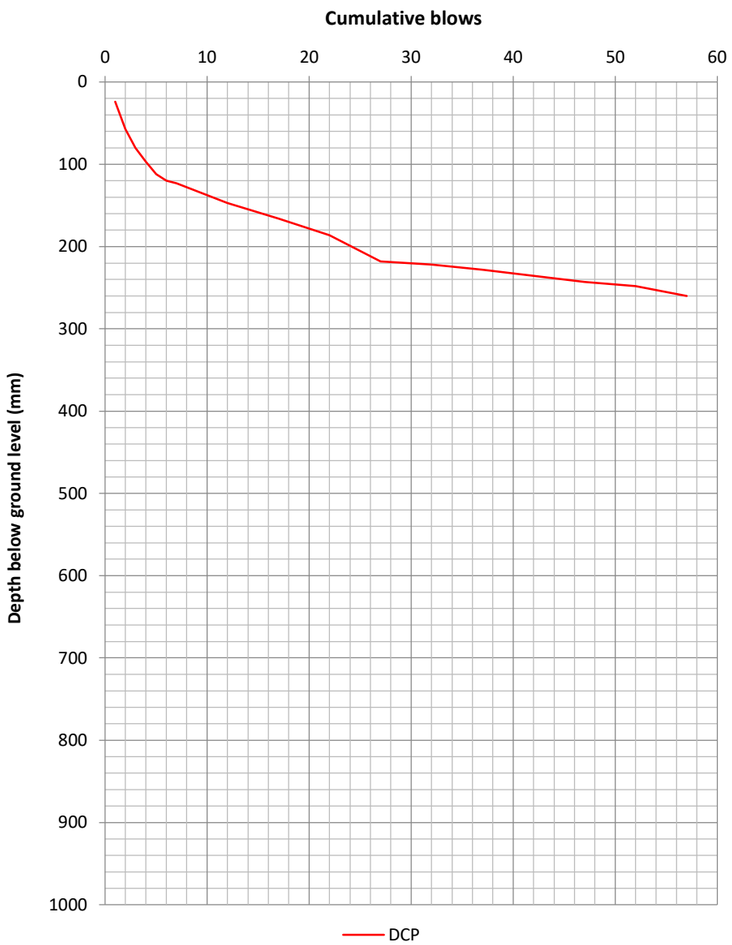
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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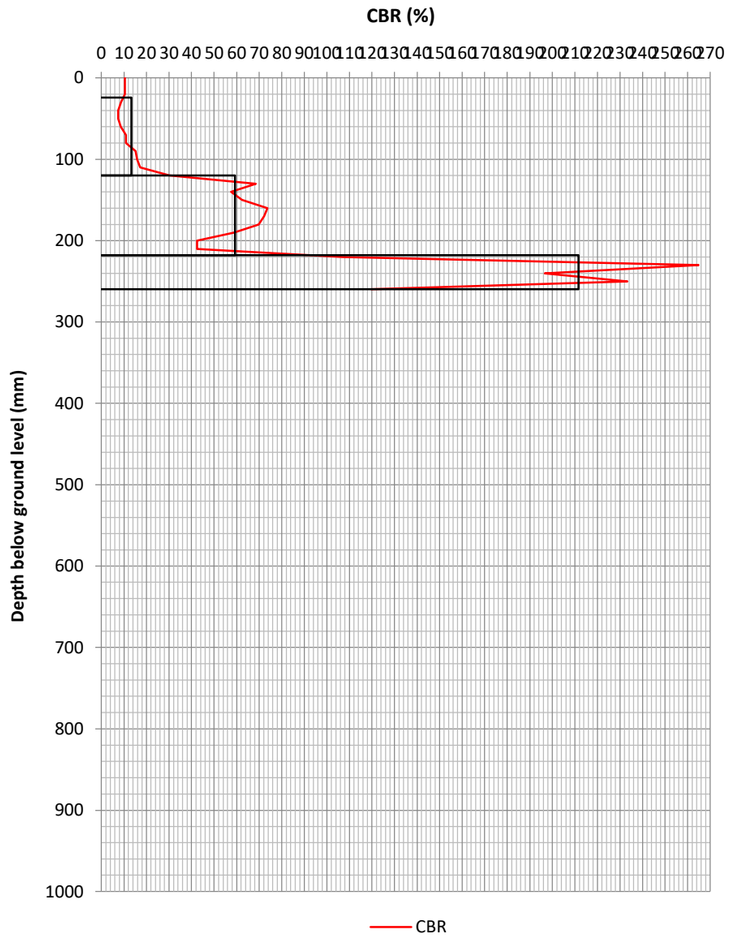
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP14	09/09/2022	0	60	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**13.3**	96	24	120
2	**59.3**	98	120	218
3	**211.6**	42	218	260

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

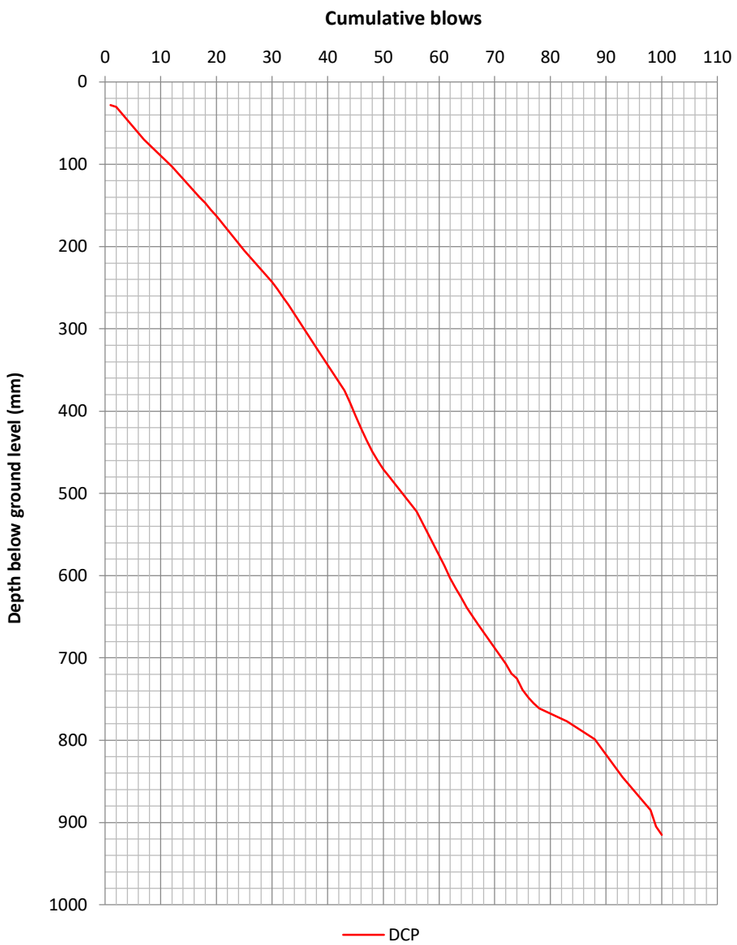
Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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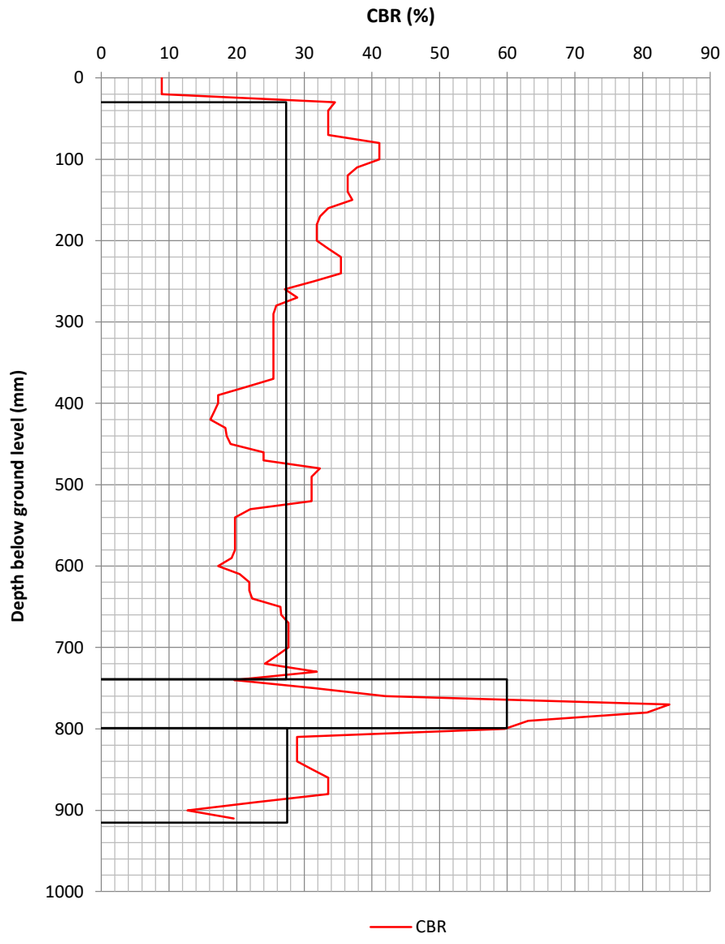
Dynamic Cone Penetrometer (DCP) test

Location	Date of test	Start depth (mm)	Zero reading (mm)	Operator
DCP15	09/09/2022	0	55	JT

Plot showing number of blows against depth



Plot showing CBR (%) against depth



Layer properties

Layer No.	CBR (%)	Thickness (mm)	Start depth (mmBGL)	Base depth (mmBGL)
1	**27.3**	709	30	739
2	**60.0**	60	739	799
3	**27.5**	116	799	915

Notes

1. Test procedure following Highways England Document CS229 Data for Pavement Assessment.

Calculations

Log10 (Uncorrected (UC) CBR) = 2.48 - 1.057Log10(mm/blow)

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Summary of dynamic probing locations

Equipment checked and in accordance with EN ISO 22476-2, 5.1.

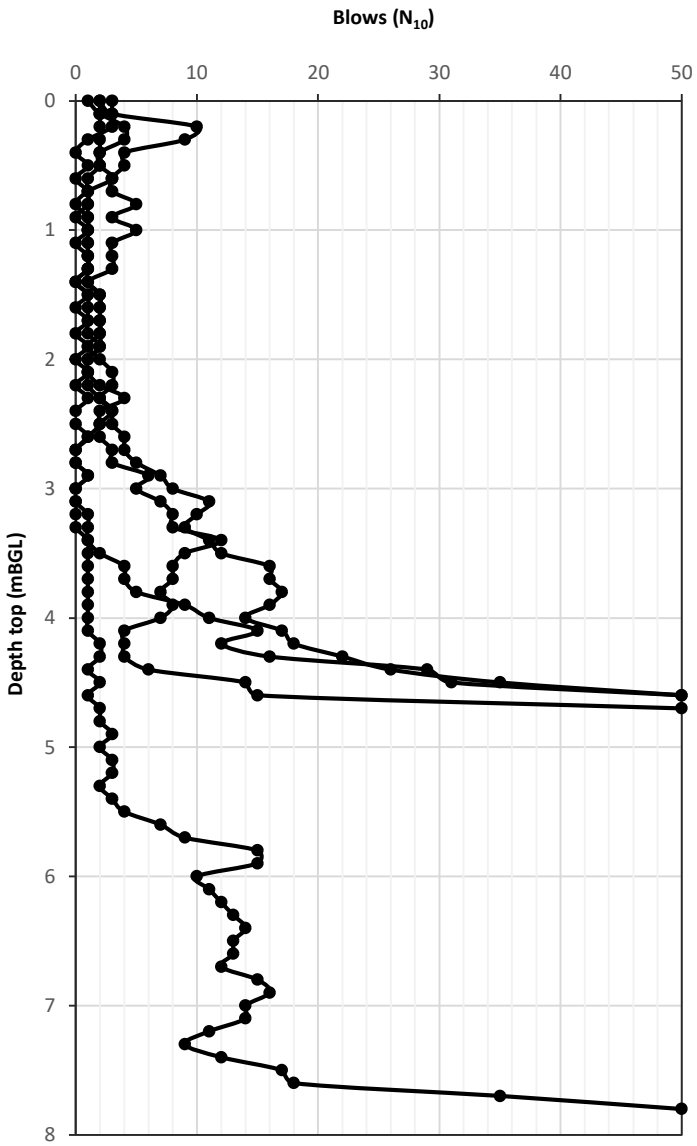
Fixed

DPSH-B

Premier

Compact 110

110.71

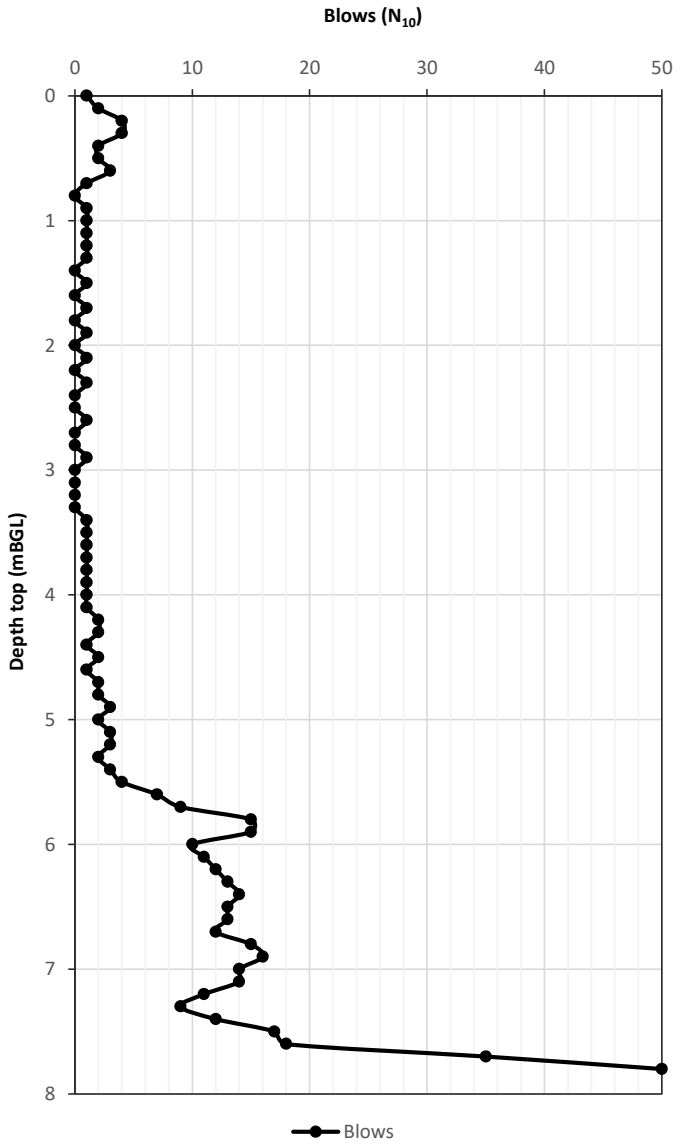


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Summary for dynamic probing location DP01

Easting	-	**Anvil Type**	Fixed
Northing	-	**Dynamic Probe Type**	DPSH-B
Ground Level (mAOD)	-	**Manufacturer**	Premier
Test Date	09/09/2022	**Model**	Compact 110
Cone Type	Fixed	**Model Number**	110.71

Equipment checked and in accordance with EN ISO 22476-2, 5.1.

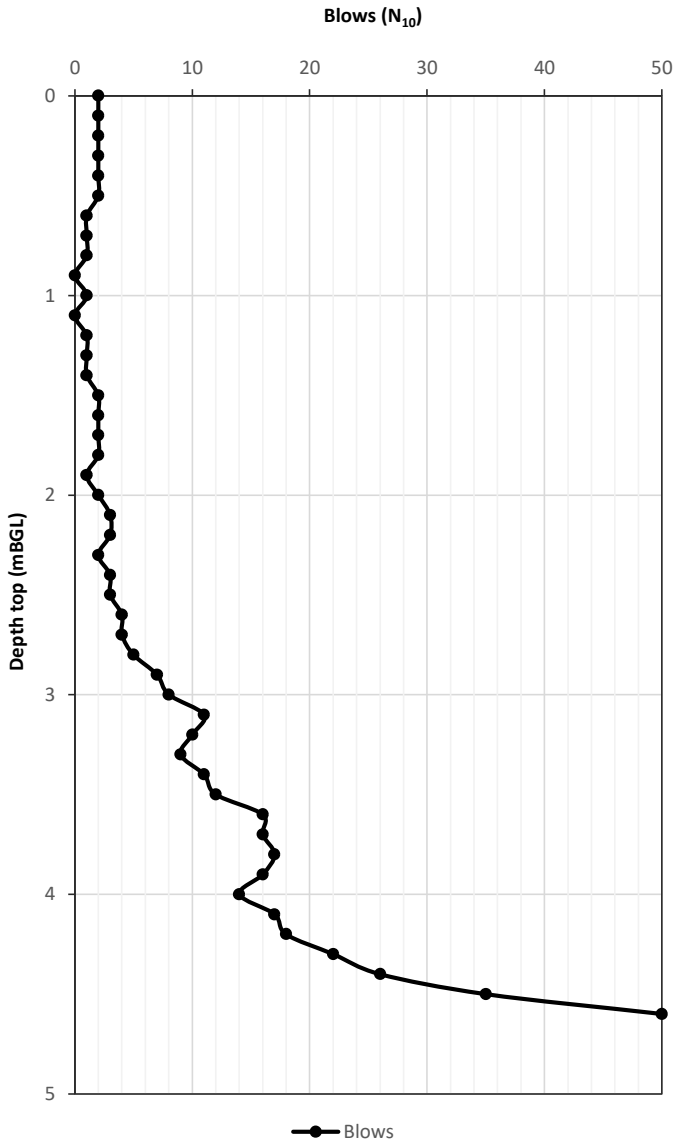


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Summary for dynamic probing location DP02

Easting	-	**Anvil Type**	Fixed
Northing	-	**Dynamic Probe Type**	DPSH-B
Ground Level (mAOD)	-	**Manufacturer**	Premier
Test Date	09/09/2022	**Model**	Compact 110
Cone Type	Fixed	**Model Number**	110.71

Equipment checked and in accordance with EN ISO 22476-2, 5.1.

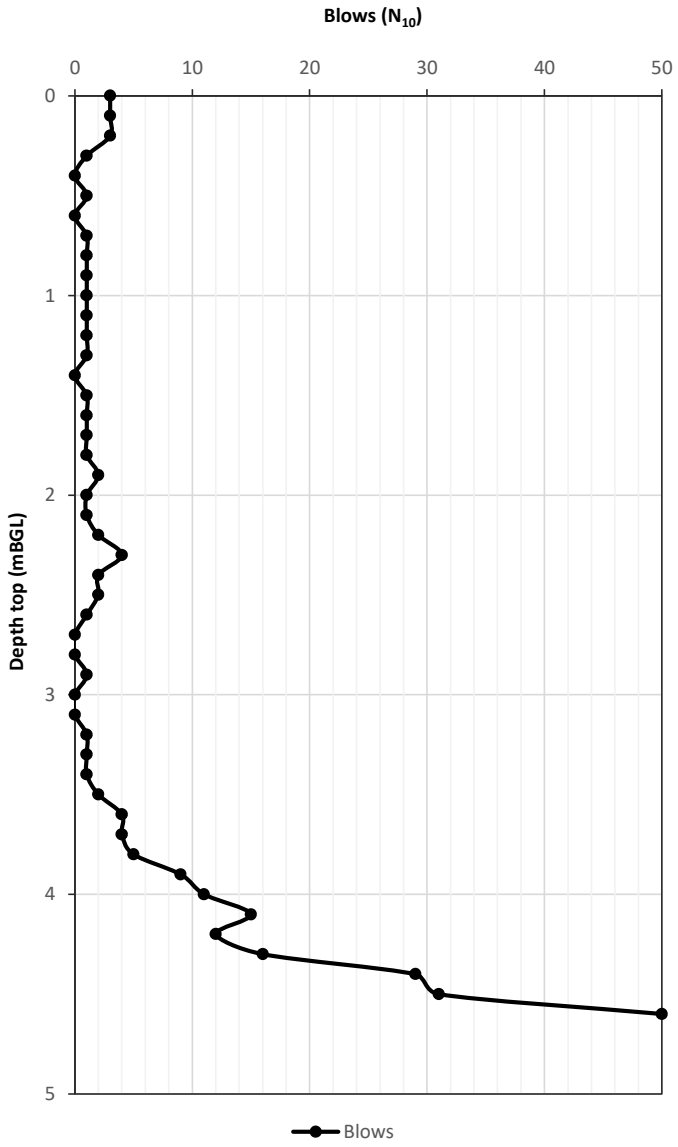


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Summary for dynamic probing location DP03

Easting	-	**Anvil Type**	Fixed
Northing	-	**Dynamic Probe Type**	DPSH-B
Ground Level (mAOD)	-	**Manufacturer**	Premier
Test Date	09/09/2022	**Model**	Compact 110
Cone Type	Fixed	**Model Number**	110.71

Equipment checked and in accordance with EN ISO 22476-2, 5.1.

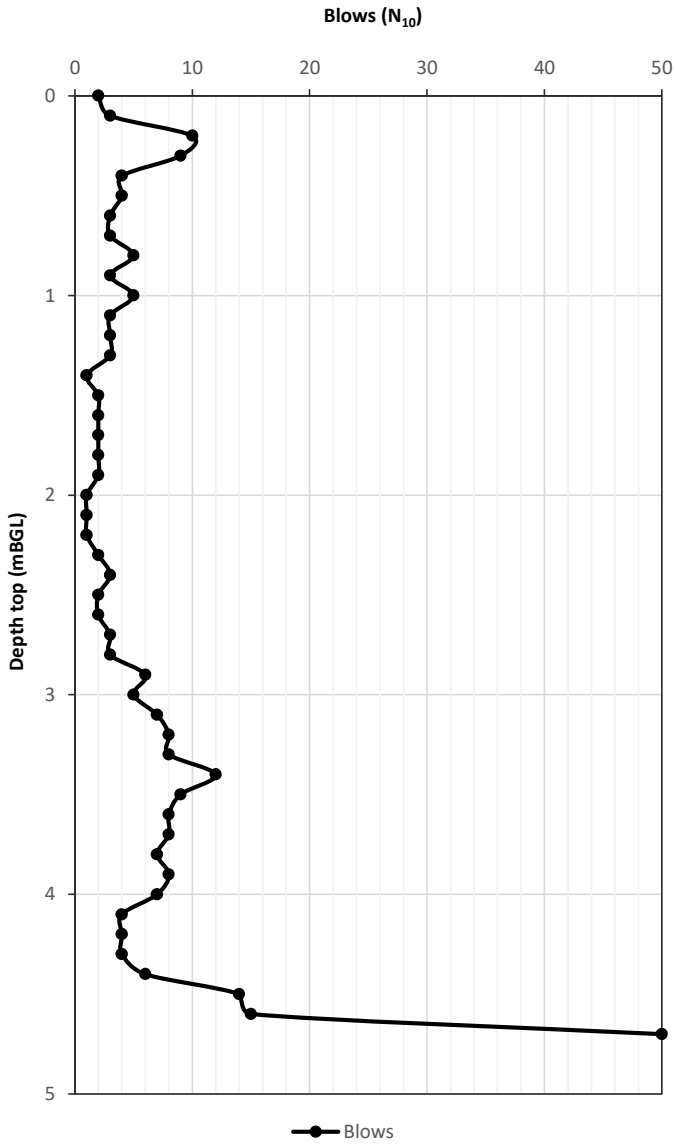


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Summary for dynamic probing location DP04

Easting	-	**Anvil Type**	Fixed
Northing	-	**Dynamic Probe Type**	DPSH-B
Ground Level (mAOD)	-	**Manufacturer**	Premier
Test Date	09/09/2022	**Model**	Compact 110
Cone Type	Fixed	**Model Number**	110.71

Equipment checked and in accordance with EN ISO 22476-2, 5.1.



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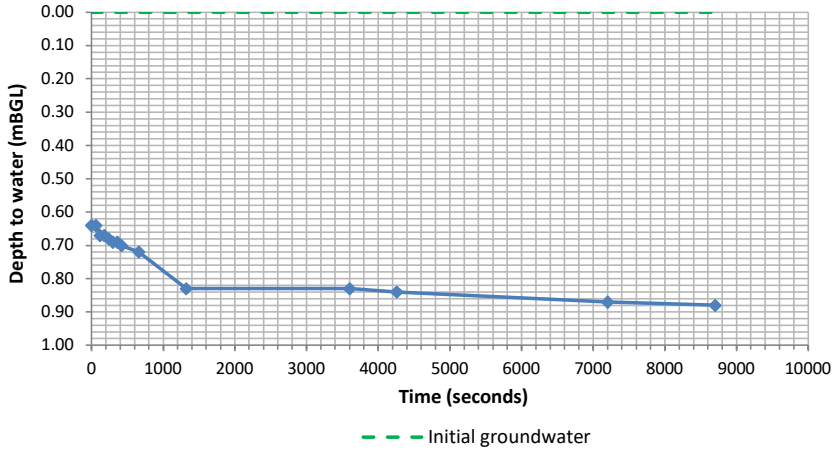
Permeability test in a borehole using open systems (BS EN ISO 22282-2:2012)

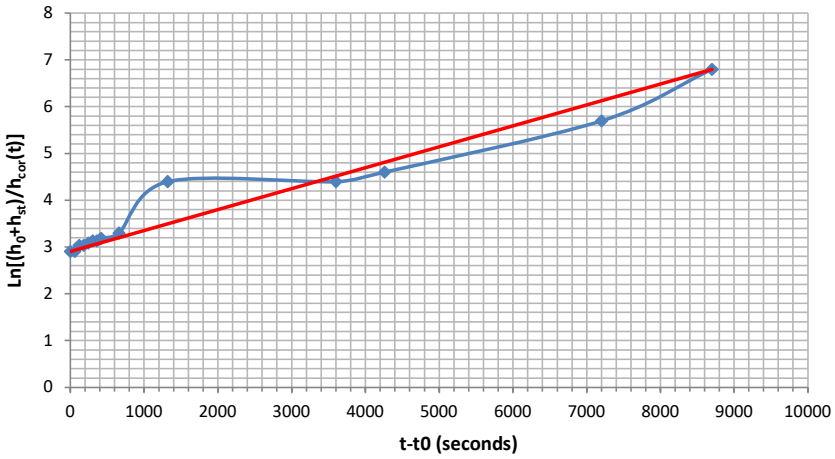
Location	Test number	Test method	Test system	Test date
WS05	1	Falling head	Open borehole	08/09/2022

Test base (m)	Test section length (m)	Test diameter (m)
3.00	3.00	0.087

Variables at start of test

Groundwater (mBGL)	Water after injection (mBGL)	Change in head (m)
-	0.64	2.36





F	Shape factor according BS EN ISO 22282-1:2012	4.452	m
S	Cross sectional area of test section	0.0059	m^2
h_{st}	Corrective term to initial static level	2.12E+00	m
α	Gradient of line alpha	4.47E-04	s^{-1}
k	**Permeability (α S / F)**	**5.97E-07**	**m/s**

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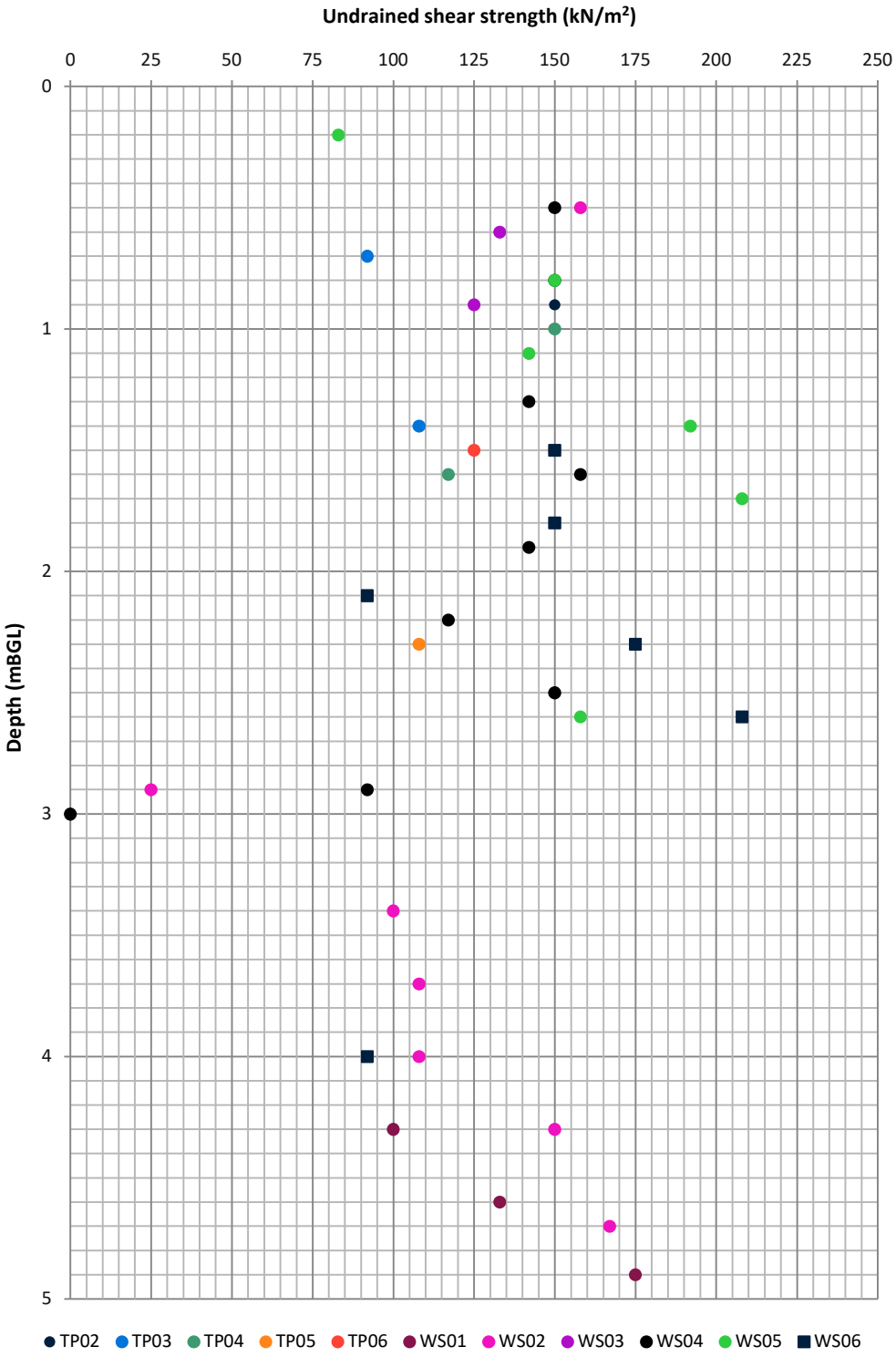
Table summarising Pocket Penetrometer results

** Instrument limit reached.*

Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m^2)
TP02	0.50	3/3/3	3.00	150
TP02	0.90	3/3/3	3.00	150
TP03	0.70	2/2/1.5	1.83	92
TP03	1.40	1.5/2.5/2.5	2.17	108
TP04	1.00	3/3/3	3.00	150
TP04	1.60	1.5/2.5/3	2.33	117
TP05	1.50	3/3/3	3.00	150
TP05	2.30	1.5/2.5/2.5	2.17	108
TP06	1.50	2.5/2.5/2.5	2.50	125
WS01	4.30	2/2/2	2.00	100
WS01	4.60	2.5/2.5/3	2.67	133
WS01	4.90	3.5/3.5/3.5	3.50	175
WS02	0.50	3.5/3/3	3.17	158
WS02	2.90	0.5/0.5/0.5	0.50	25
WS02	3.40	2/2/2	2.00	100
WS02	3.70	2.5/2/2	2.17	108
WS02	4.00	2.5/2/2	2.17	108
WS02	4.30	3/3/3	3.00	150
WS02	4.70	3.5/3/3.5	3.33	167
WS03	0.60	2.5/2.5/3	2.67	133
WS03	0.90	3/2/2.5	2.50	125
WS04	0.50	2.5/3.5/3	3.00	150
WS04	0.80	2.5/3.5/3	3.00	150
WS04	1.30	3.5/2.5/2.5	2.83	142
WS04	1.60	3/3/3.5	3.17	158
WS04	1.90	3/3/2.5	2.83	142
WS04	2.20	2/3/2	2.33	117
WS04	2.50	3/3/3	3.00	150
WS04	2.90	2/2/1.5	1.83	92
WS04	3.00	0/0/0	0.00	0
WS05	0.20	1.5/1/2.5	1.67	83
WS05	0.80	3.5/3/2.5	3.00	150
WS05	1.10	3/3.5/2	2.83	142
WS05	1.40	3.5/4/4	3.83	192
WS05	1.70	3.5/4.5/4.5	4.17	208
WS05	2.60	3.5/3.5/2.5	3.17	158
WS06	1.50	2.5/3.5	3.00	150
WS06	1.80	3/3/3	3.00	150
WS06	2.10	2/1.5/2	1.83	92
WS06	2.30	3.5/3.5/3.5	3.50	175
WS06	2.60	4.5/4/4	4.17	208
WS06	4.00	1.5/2/2	1.83	92

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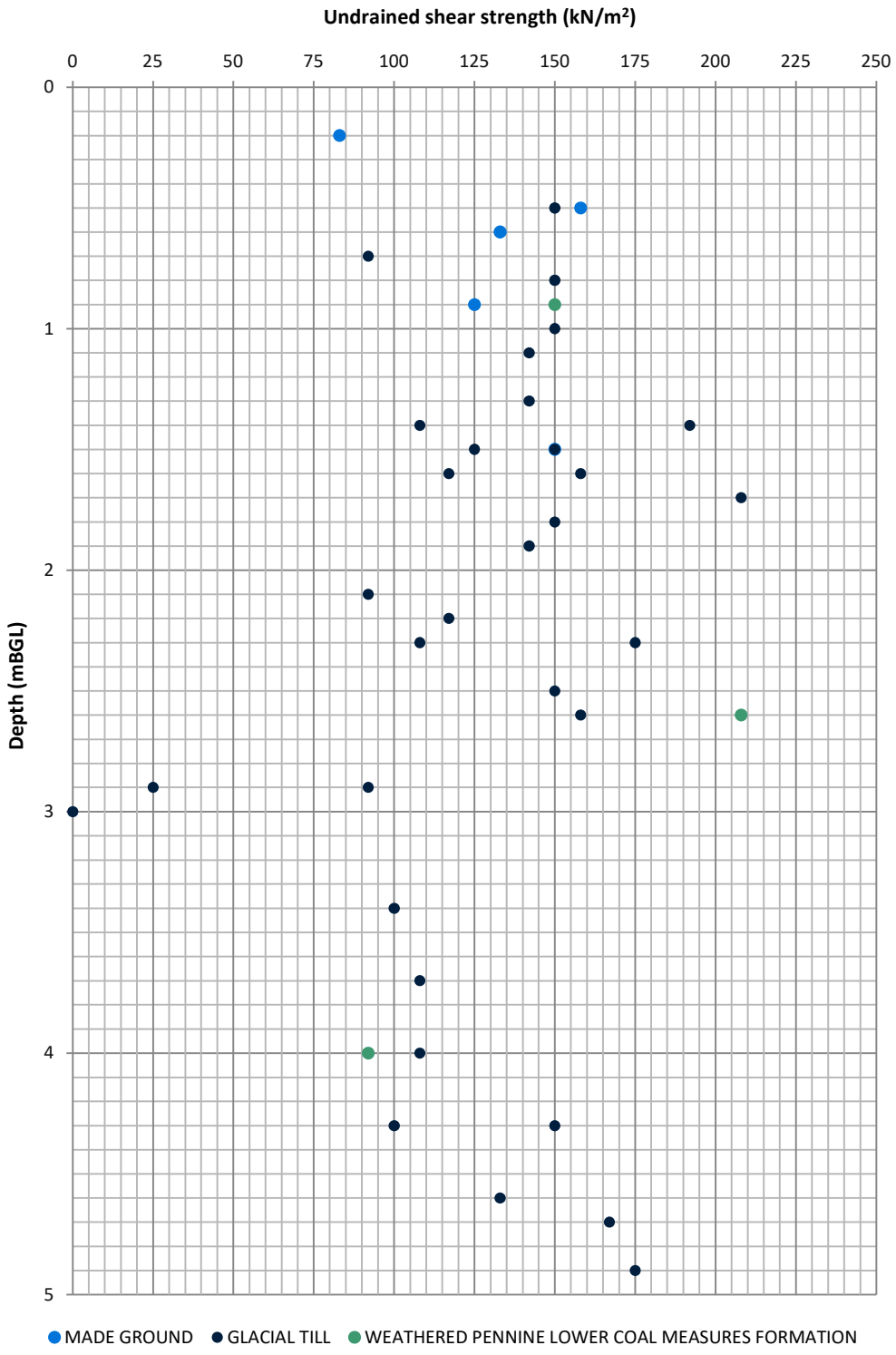
Plot summarising Pocket Penetrometer results versus depth filtered by location



Created: 23/01/2023

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Plot summarising Pocket Penetrometer results versus depth filtered by geology



Created: 23/01/2023

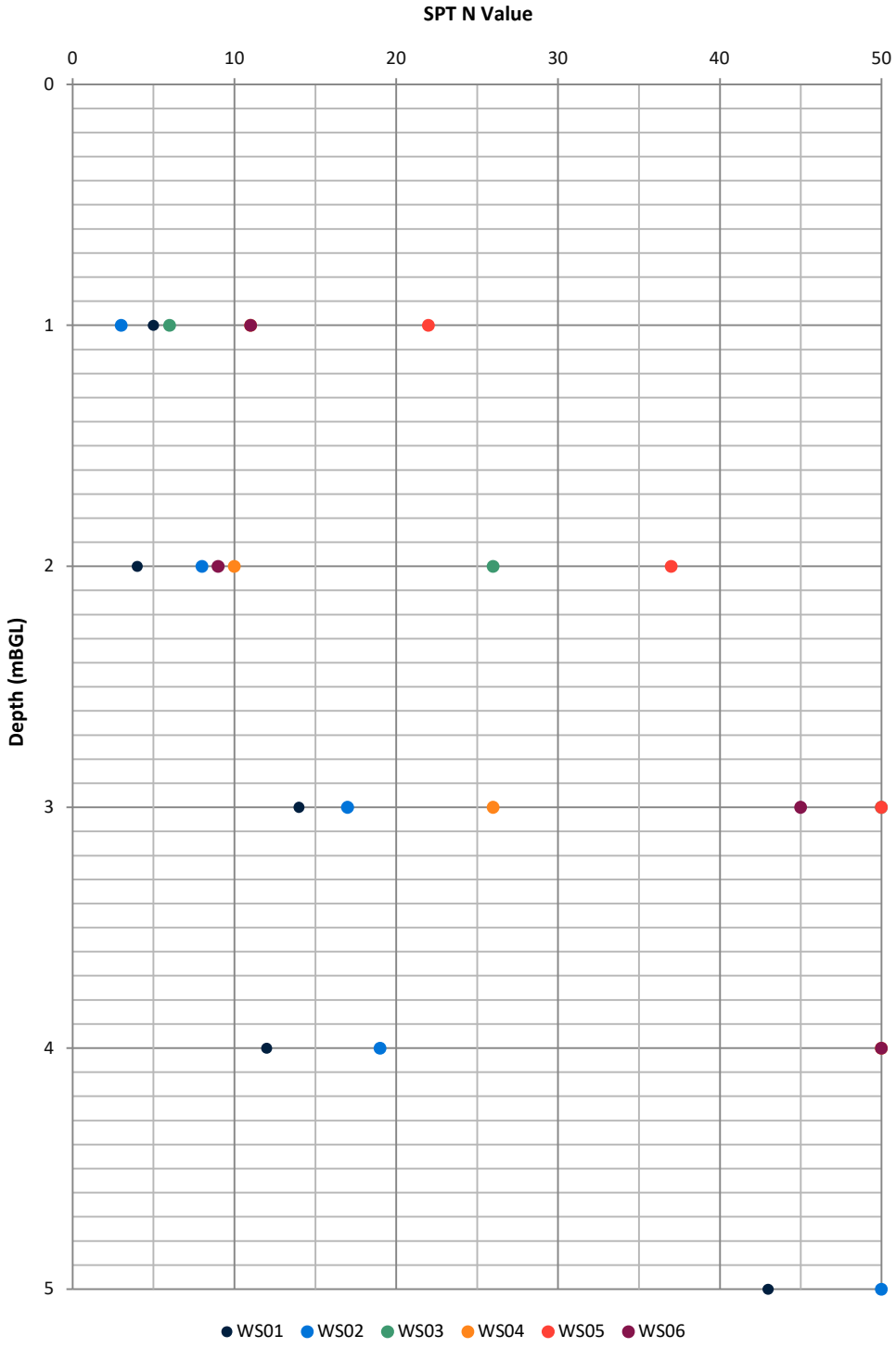
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Table summarising Standard Penetration Test (SPT) results

Location	Start Depth (m)					Penetration (mm)	
		Seating 1-2	Main 1-4	Total Seating	Total Main	Total Seating	Total Main
WS01	1.00	1/1	1/2/1/1	2	5	150	300
WS01	2.00	1/1	1/1/1/1	2	4	150	300
WS01	3.00	2/3	2/4/4/4	5	14	150	300
WS01	4.00	1/2	1/3/3/5	3	12	150	300
WS01	5.00	8/7	9/9/12/13	15	43	150	300
WS02	1.00	1/1	1/0/1/1	2	3	150	300
WS02	2.00	1/1	2/1/3/2	2	8	150	300
WS02	3.00	1/2	2/5/5/5	3	17	150	300
WS02	4.00	2/3	4/5/5/5	5	19	150	300
WS02	5.00	6/7	12/13/13/12	13	50	150	285
WS03	1.00	1/1	1/2/1/2	2	6	150	300
WS03	2.00	1/2	5/5/6/10	3	26	150	300
WS03	3.00	3/4	12/13/12/13	7	50	150	295
WS04	1.00	1/1	2/3/3/3	2	11	150	300
WS04	2.00	1/2	1/2/3/4	3	10	150	300
WS04	3.00	1/3	4/4/7/11	4	26	150	300
WS04	4.00	9/14	13/23/14	23	50	150	170
WS05	1.00	1/2	2/4/7/9	3	22	150	300
WS05	2.00	4/6	9/7/10/11	10	37	150	300
WS05	3.00	11/11	12/12/12/14	22	50	150	250
WS06	1.00	1/2	3/2/3/3	3	11	150	300
WS06	2.00	1/1	2/1/3/3	2	9	150	300
WS06	3.00	7/7	12/9/11/13	14	45	150	300
WS06	4.00	9/11	23/27	20	50	150	150

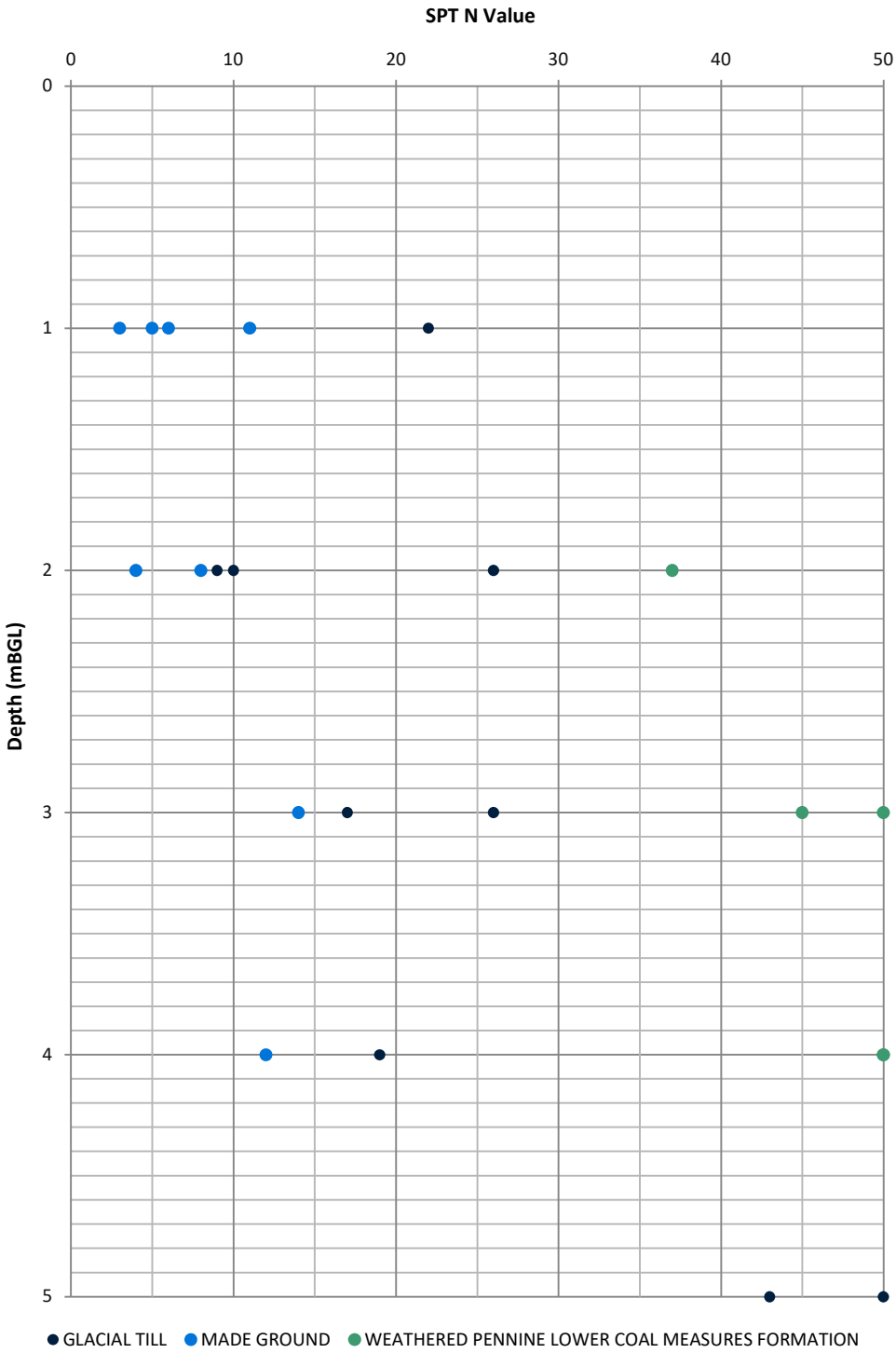
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Plot summarising Standard Penetration Test (SPT) results versus depth filtered by location



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Plot summarising Standard Penetration Test (SPT) results versus depth filtered by geology



Appendix E Geotechnical Laboratory Test Certificates

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

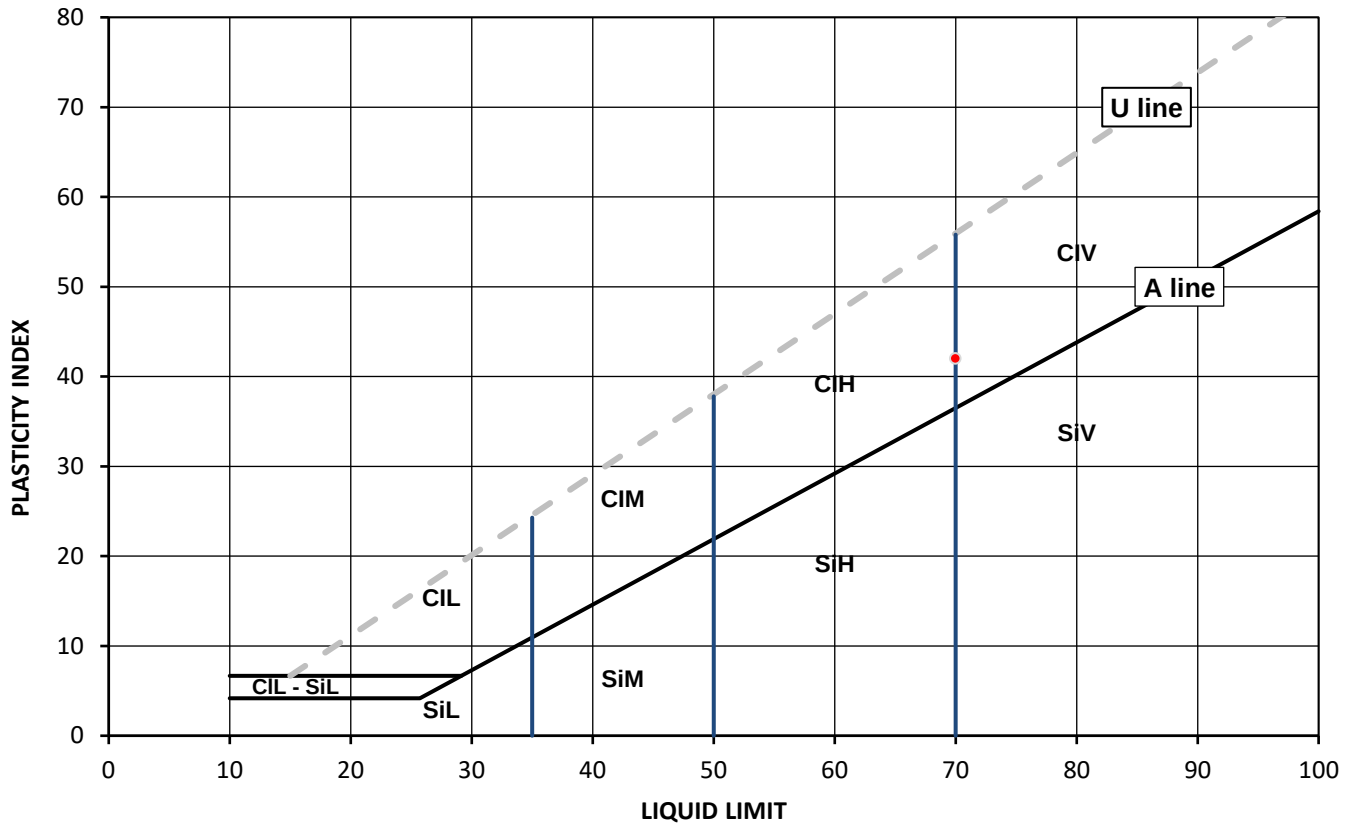
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-83779
		Date Sampled:	08/09/2022
		Date Received:	13/09/2022
Contact:	Admin	Date Tested:	20/09/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2422841	Depth Top [m]:	0.70
Hole No.:	WS030.703	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Dark grey gravelly CLAY with fragments of shells		
Sample Preparation:	Tested after washing to remove >425um		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
9.8	70	28	42	37



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Koziel

Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 05/10/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

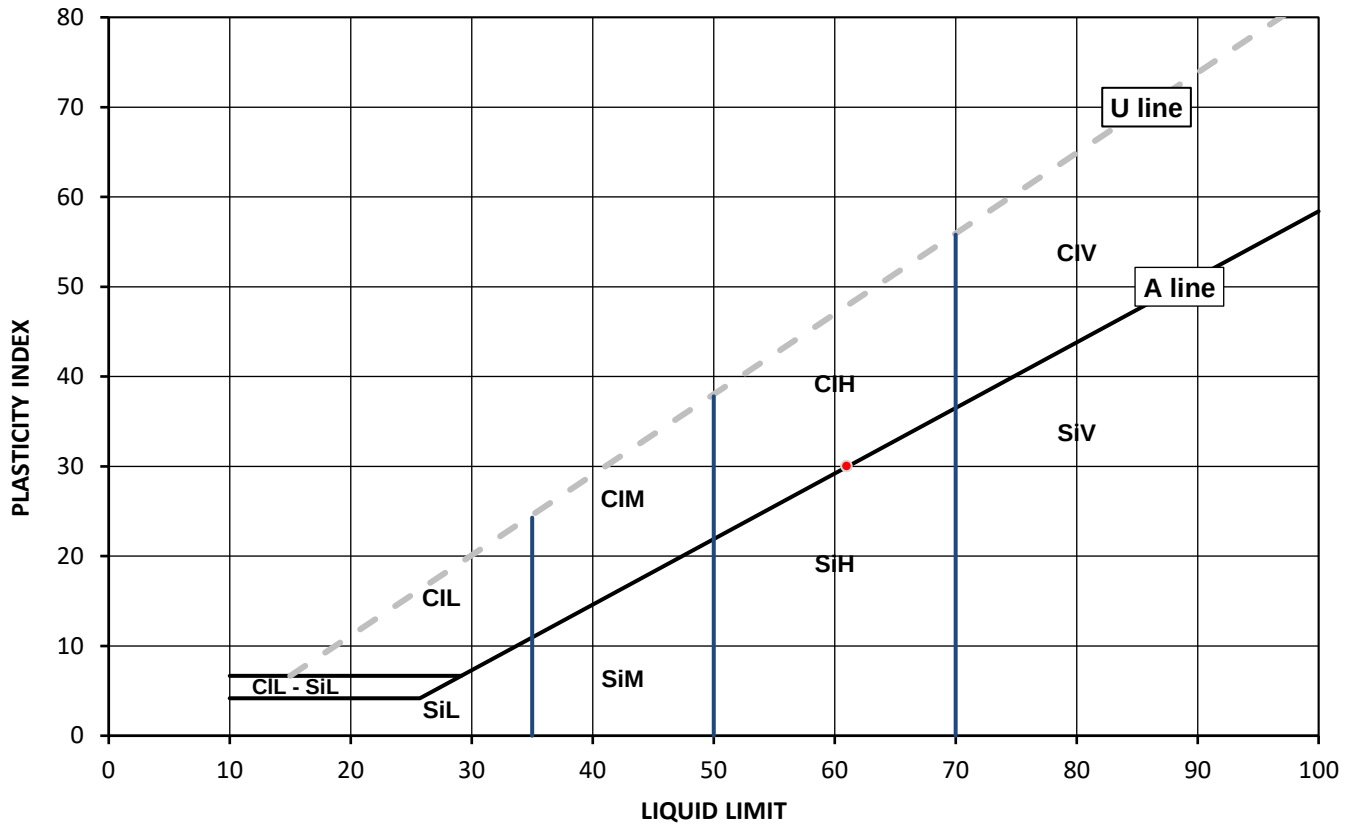
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-83779
		Date Sampled:	08/09/2022
		Date Received:	13/09/2022
Contact:	Admin	Date Tested:	20/09/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2422842	Depth Top [m]:	0.50
Hole No.:	WS040.502	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	D
Sample Description:	Brown slightly gravelly CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
29	61	31	30	96



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed: Katarzyna Koziel

Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Date Reported: 05/10/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

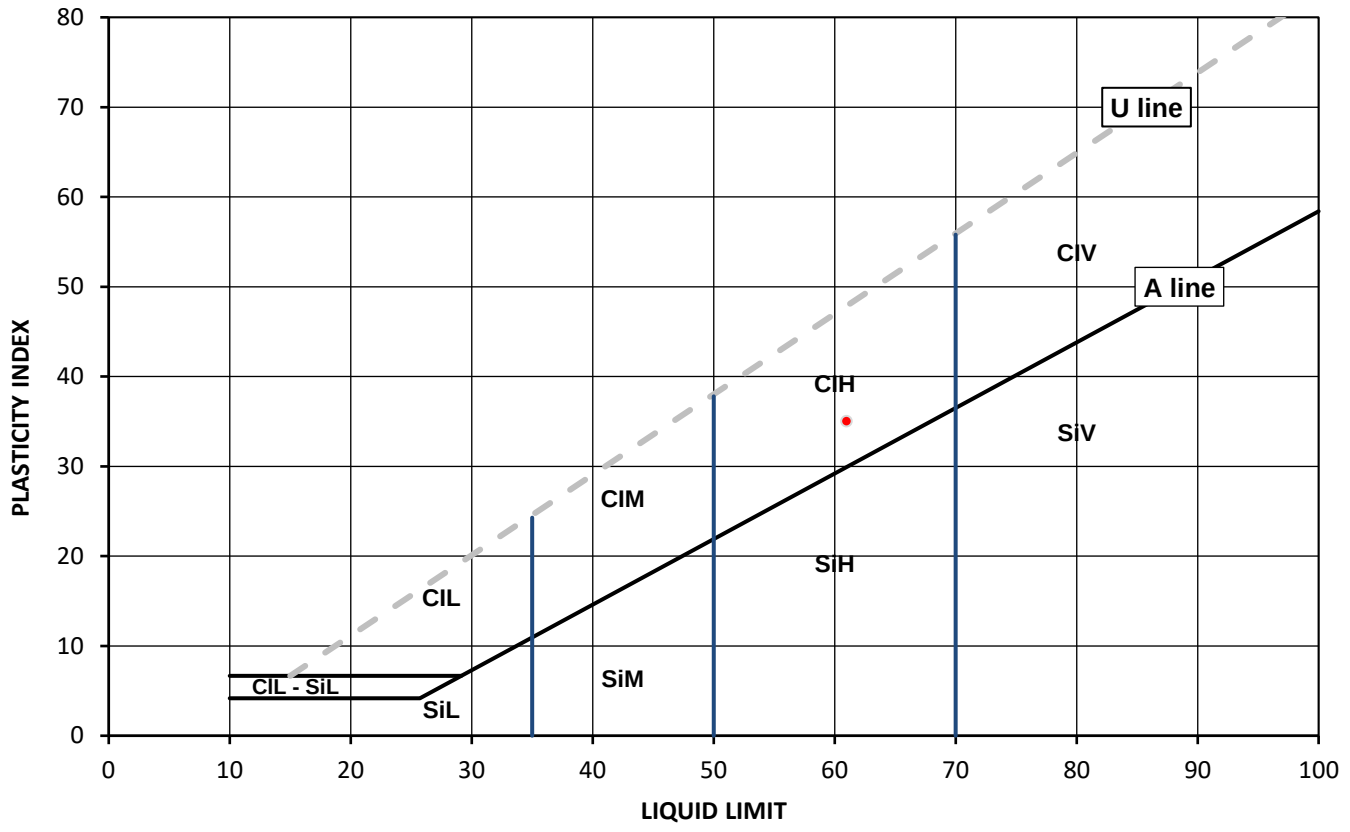
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-83779
		Date Sampled:	08/09/2022
		Date Received:	13/09/2022
Contact:	Admin	Date Tested:	20/09/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2422843	Depth Top [m]:	1.45
Hole No.:	WS041.453	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Yellowish brown CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	61	26	35	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 05/10/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

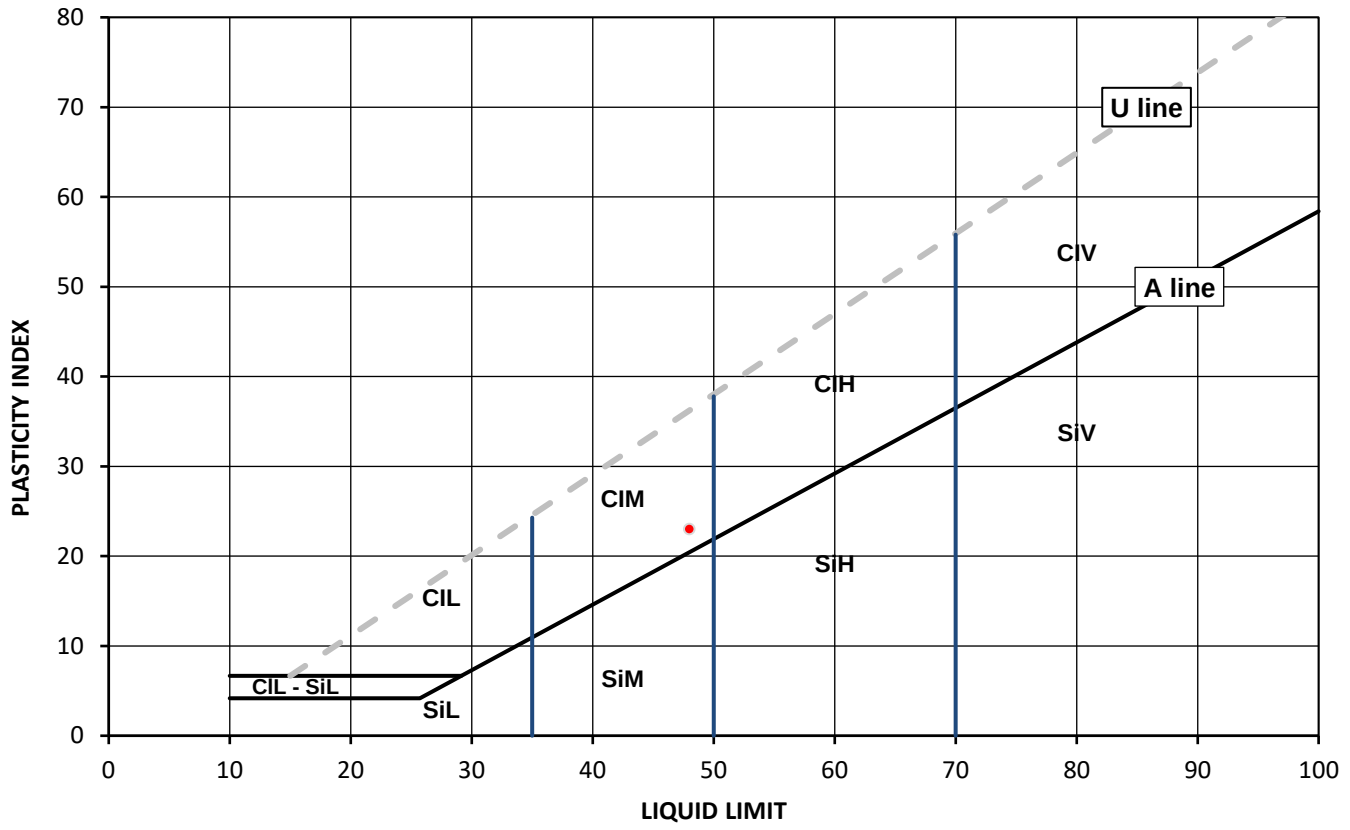
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-83779
		Date Sampled:	08/09/2022
		Date Received:	13/09/2022
Contact:	Admin	Date Tested:	20/09/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2422844	Depth Top [m]:	0.80
Hole No.:	WS050.802	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	D
Sample Description:	Yellowish brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	48	25	23	95



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 05/10/2022

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Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-83779
		Date Sampled:	08/09/2022
		Date Received:	13/09/2022
Contact:	Admin	Date Tested:	20/09/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

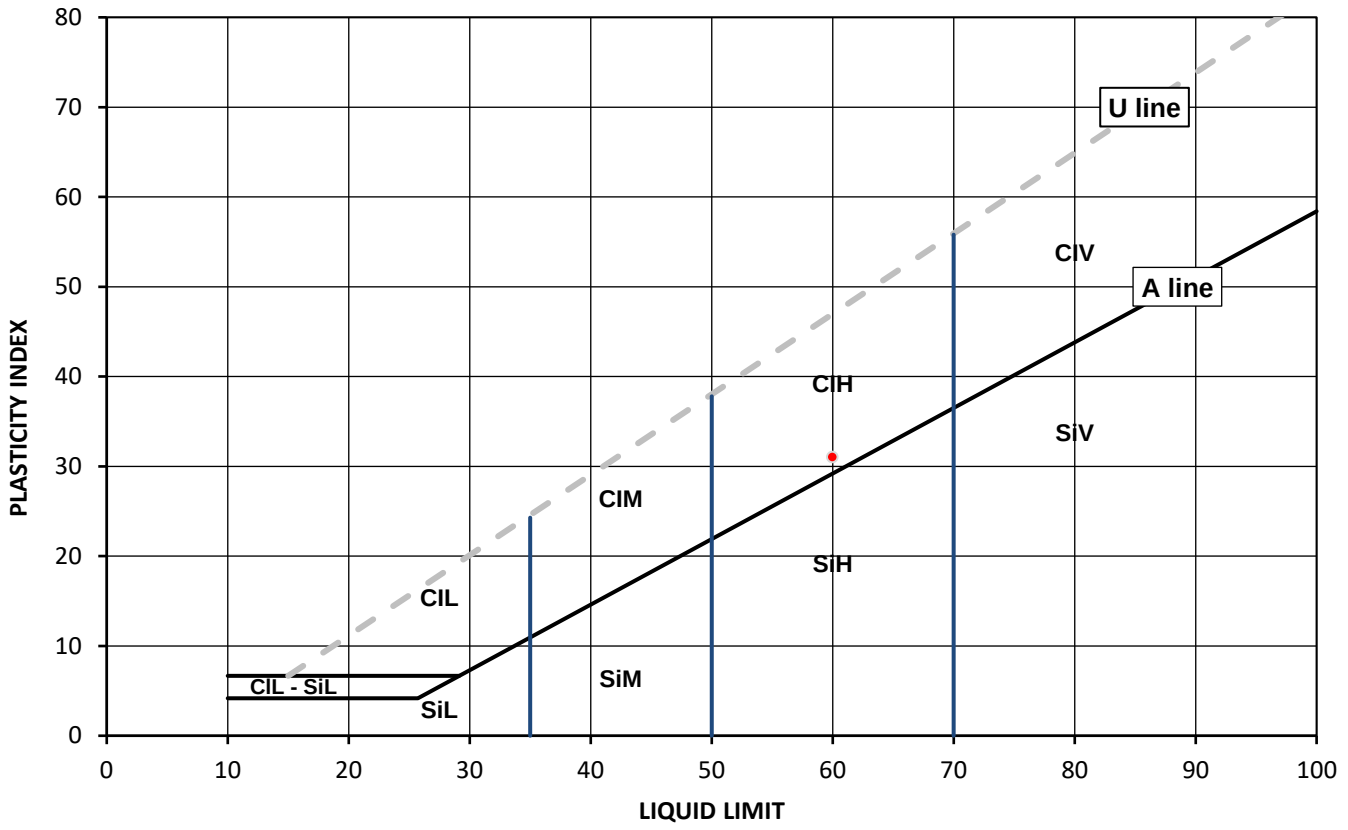
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2422845	Depth Top [m]:	1.40
Hole No.:	WS061.402	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	D
Sample Description:	Grey slightly gravelly CLAY		

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	60	29	31	71



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

Date Reported: 05/10/2022

GF 232.12

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY

Contact: Admin

Site Address: East Bierley Sports Community Association

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Client Reference: STU5725
Job Number: 22-83779
Date Sampled: 08/09/2022
Date Received: 13/09/2022
Date Tested: 20/09/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2422841	WS030.703	3	0.70	Not Given	D	Dark grey gravelly CLAY with fragments of shells	Atterberg 1 Point	9.8		37	70	28	42						
2422842	WS040.502	2	0.50	Not Given	D	Brown slightly gravelly CLAY	Atterberg 1 Point	29		96	61	31	30						
2422843	WS041.453	3	1.45	Not Given	D	Yellowish brown CLAY	Atterberg 1 Point	26		100	61	26	35						
2422844	WS050.802	2	0.80	Not Given	D	Yellowish brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	24		95	48	25	23						
2422845	WS061.402	2	1.40	Not Given	D	Grey slightly gravelly CLAY	Atterberg 1 Point	16		71	60	29	31						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Date Reported: 05/10/2022

GF 234.14

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY

Contact: Admin

Site Address: East Bierley Sports Community Association

Client Reference: STU5725
Job Number: 22-83779
Date Sampled: 08/09/2022
Date Received: 13/09/2022
Date Tested: 20/09/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2422841	WS030.703	3	0.70	Not Given	D	Dark grey gravelly CLAY with fragments of shells		9.8	Sample was quartered, oven dried at 106.8 °C			
2422842	WS040.502	2	0.50	Not Given	D	Brown slightly gravelly CLAY		29	Sample was quartered, oven dried at 106.8 °C			
2422843	WS041.453	3	1.45	Not Given	D	Yellowish brown CLAY		26	Sample was quartered, oven dried at 106.8 °C			
2422844	WS050.802	2	0.80	Not Given	D	Yellowish brown slightly gravelly slightly sandy CLAY		24	Sample was quartered, oven dried at 106.8 °C			
2422845	WS061.402	2	1.40	Not Given	D	Grey slightly gravelly CLAY		16	Sample was quartered, oven dried at 106.8 °C			

Comments:

Signed:

Katarzyna Koziel
Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Date Reported: 05/10/2022

GF 099.16

Admin
Soiltechnics Limited
Cedar Barn
White Lodge
Walgrave
Northampton
NN6 9PY

e: admin@soiltechnics.net

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 22-83781

Project / Site name:	East Bierley Sports Community Association	**Samples received on:**	08/09/2022
Your job number:	STU5725	**Samples instructed on/ Analysis started on:**	13/09/2022
Your order number:	POR013592	**Analysis completed by:**	22/09/2022
Report Issue Number:	1	**Report issued on:**	26/09/2022
Samples Analysed:	4 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory. Iss No 22-83781-1 East Bierley Sports Community Association STU5725
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-83781
Project / Site name: East Bierley Sports Community Association
Your Order No: POR013592

Lab Sample Number				2422847	2422848	2422849	2422850
Sample Reference				WS011.002	WS030.703	WS040.502	WS063.003
Sample Number				2	3	2	3
Depth (m)				1.00	0.70	0.50	3.00
Date Sampled				08/09/2022	08/09/2022	08/09/2022	08/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.4	4.9	16	7.4
Total mass of sample received	kg	0.001	NONE	0.6	0.4	0.4	0.6
General Inorganics							
pH - Automated	pH Units	N/A	MCERTS	8.2	8.7	7.3	7.7
Total Sulphate as SO4	%	0.005	MCERTS	0.129	0.077	0.078	0.189
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.083	0.39	0.99
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	150	82.6	393	985
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.8	2.7	3.8	29
Total Sulphur	%	0.005	MCERTS	0.112	0.101	0.063	0.117
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0
Heavy Metals / Metalloids							
Magnesium (water soluble)	mg/kg	5	NONE	17	22	38	56
Magnesium (leachate equivalent)	mg/l	2.5	NONE	8.7	11	19	28

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 22-83781
Project / Site name: East Bierley Sports Community Association

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2422847	WS011.002	2	1	Brown loam and sand with gravel.
2422848	WS030.703	3	0.7	Brown loam and sand with gravel.
2422849	WS040.502	2	0.5	Brown clay and sand with gravel.
2422850	WS063.003	3	3	Brown clay and sand with gravel.

Analytical Report Number : 22-83781
Project / Site name: East Bierley Sports Community Association

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

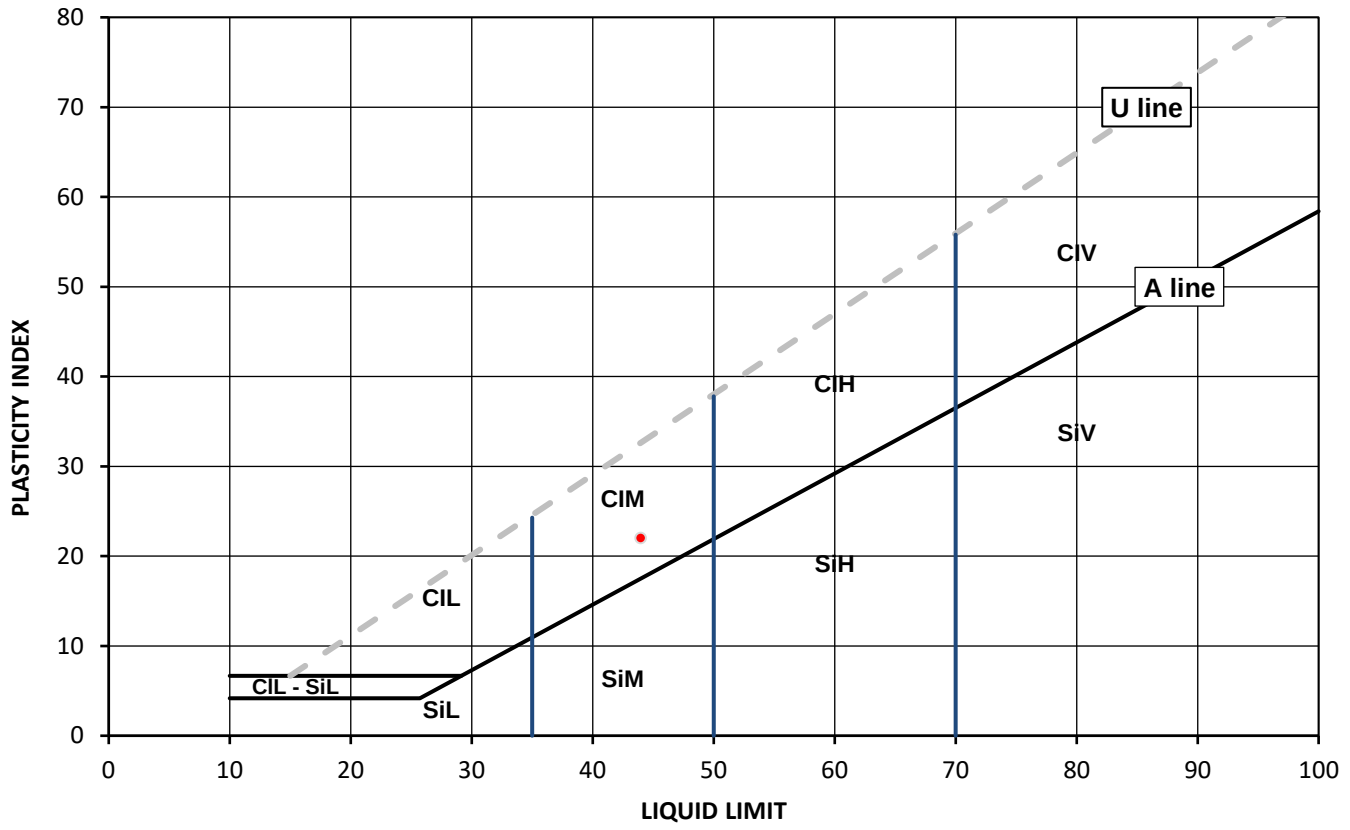
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512775	Depth Top [m]:	0.50
Hole No.:	TP010.501	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	D
Sample Description:	Dark grey sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
21	44	22	22	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
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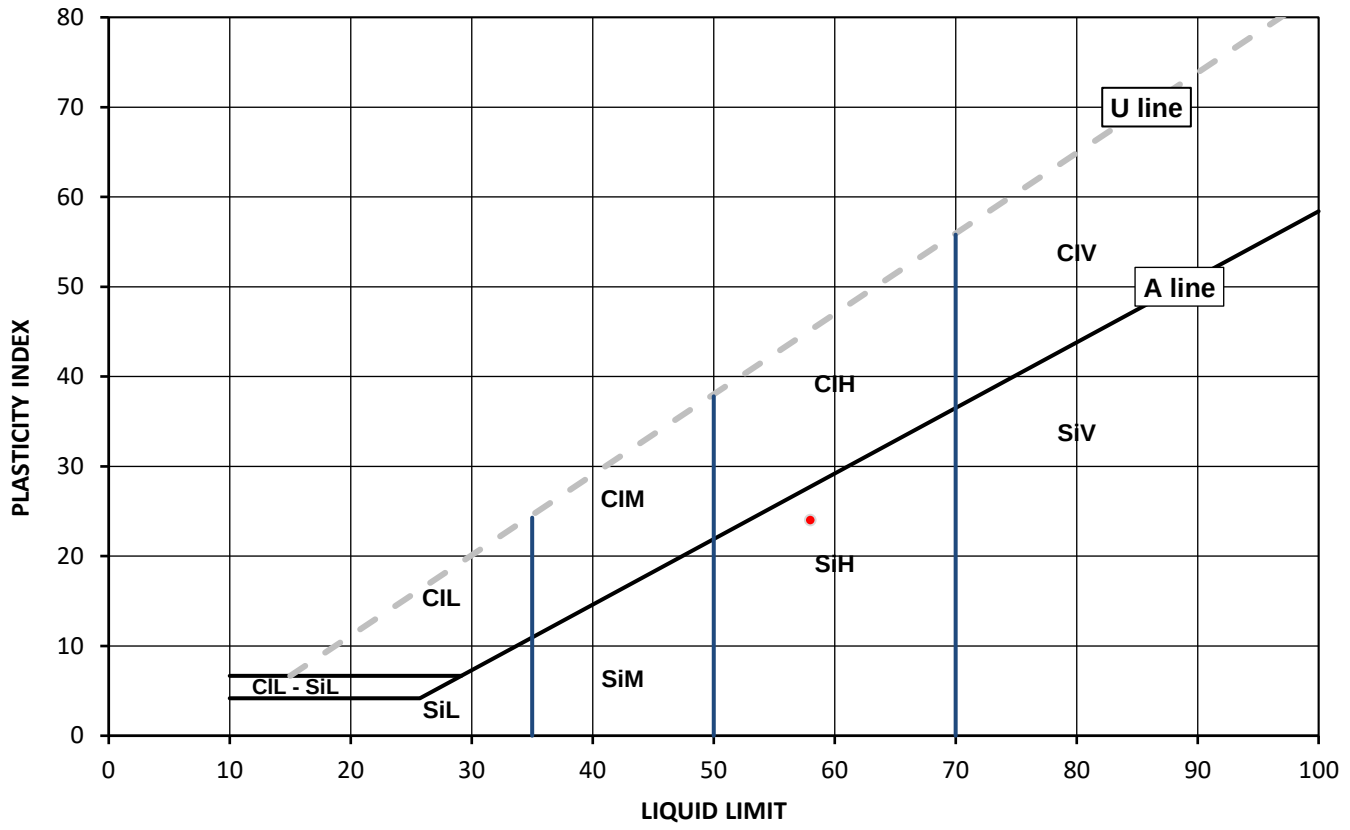
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512777	Depth Top [m]:	1.50
Hole No.:	TP011.504	Depth Base [m]:	Not Given
Sample Reference:	4	Sample Type:	D
Sample Description:	Dark grey slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
32	58	34	24	89



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Reporting Specialist
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Date Reported: 16/12/2022

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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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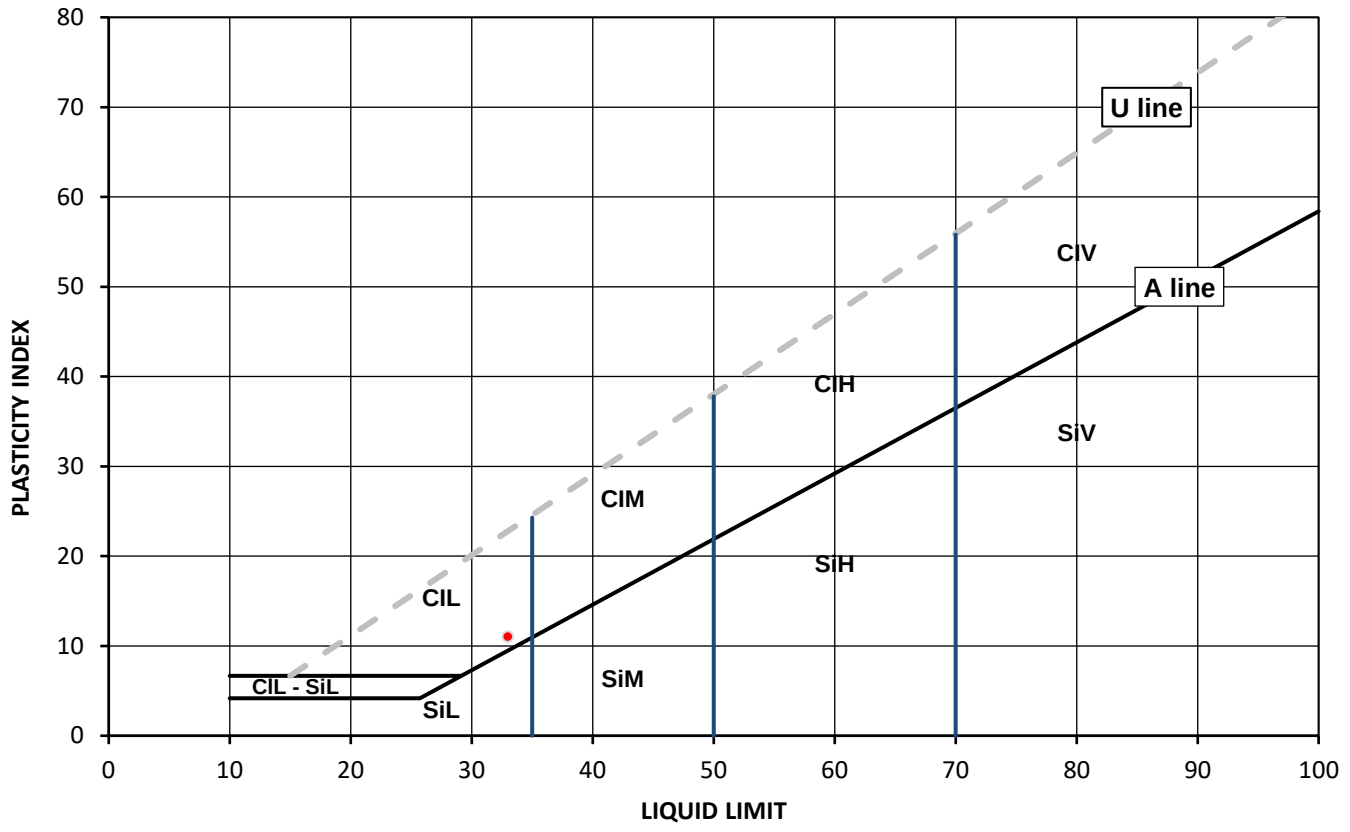
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512780	Depth Top [m]:	1.50
Hole No.:	TP021.505	Depth Base [m]:	Not Given
Sample Reference:	5	Sample Type:	D
Sample Description:	Brown very sandy slightly silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	33	22	11	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

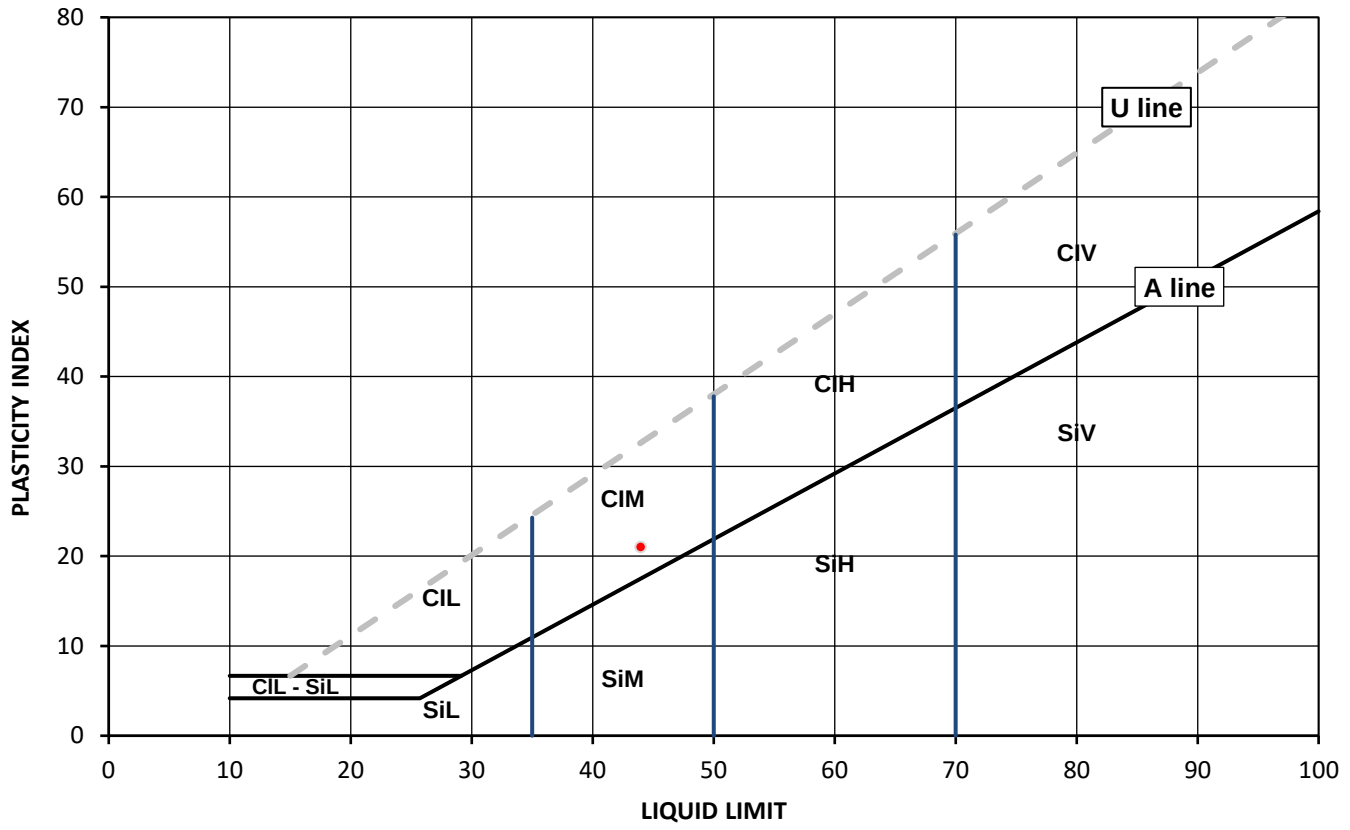
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512783	Depth Top [m]:	1.30
Hole No.:	TP031.305	Depth Base [m]:	Not Given
Sample Reference:	5	Sample Type:	D
Sample Description:	Brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	44	23	21	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

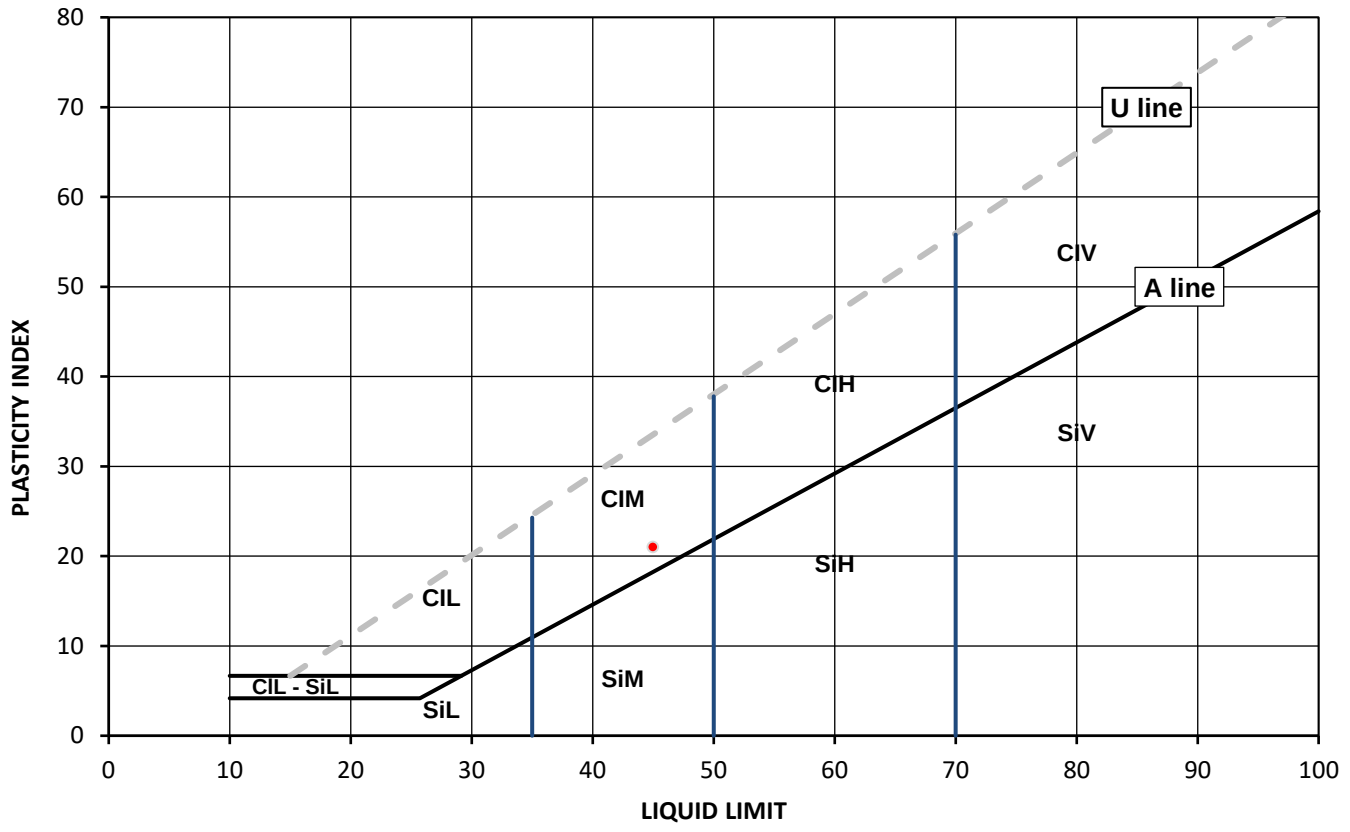
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512787	Depth Top [m]:	1.00
Hole No.:	TP041.003	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Light brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	45	24	21	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 232.12

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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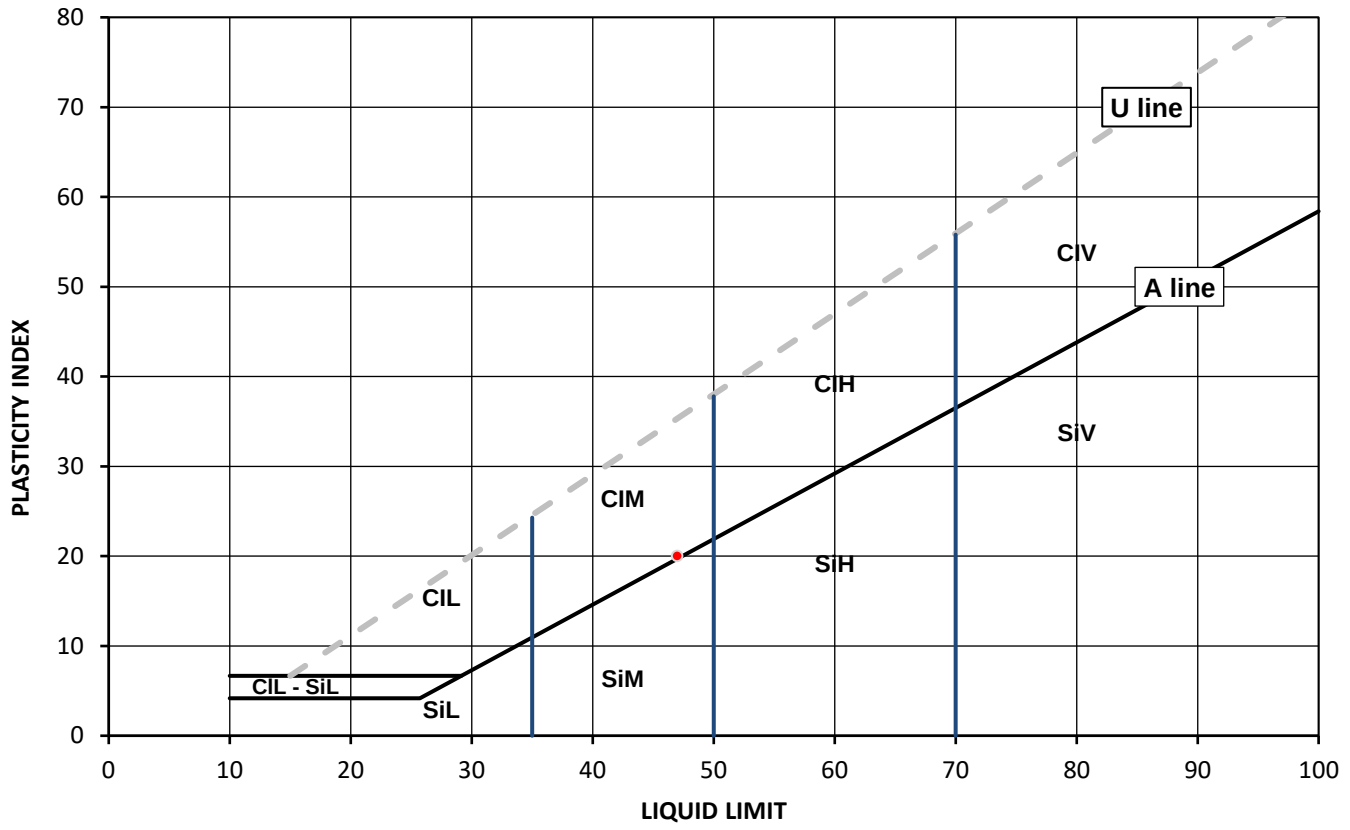
Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	05/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512789	Depth Top [m]:	1.50
Hole No.:	TP051.503	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Brownish grey slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	47	27	20	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 232.12

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY

Contact: Admin

Site Address: East Bierley Sports Community Association

Client Reference: STU5725
Job Number: 22-99038
Date Sampled: 18/11/2022
Date Received: 23/11/2022
Date Tested: 05/12/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2512775	TP010.501	1	0.50	Not Given	D	Dark grey sandy CLAY	Atterberg 1 Point	21		100	44	22	22						
2512777	TP011.504	4	1.50	Not Given	D	Dark grey slightly gravelly slightly sandy CLAY	Atterberg 1 Point	32		89	58	34	24						
2512780	TP021.505	5	1.50	Not Given	D	Brown very sandy slightly silty CLAY	Atterberg 1 Point	25		100	33	22	11						
2512782	TP030.301	1	0.30	Not Given	D	Dark brown gravelly CLAY		19											
2512783	TP031.305	5	1.30	Not Given	D	Brown sandy CLAY	Atterberg 1 Point	16		100	44	23	21						
2512784	TP031.807	7	1.80	Not Given	D	Brownish grey CLAY		15											
2512787	TP041.003	3	1.00	Not Given	D	Light brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	16		99	45	24	21						
2512788	TP050.501	1	0.50	Not Given	D	Cream colour clayey SAND		22											
2512789	TP051.503	3	1.50	Not Given	D	Brownish grey slightly sandy CLAY	Atterberg 1 Point	24		100	47	27	20						
2512790	TP061.001	1	1.00	Not Given	D	Dark brown SHALES		11											

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 16/12/2022

GF 234.14

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Soiltechnics Limited

Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY

Contact: Admin

Site Address: East Bierley Sports Community Association

Client Reference: STU5725
Job Number: 22-99038
Date Sampled: 18/11/2022
Date Received: 23/11/2022
Date Tested: 05/12/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2512775	TP010.501	1	0.50	Not Given	D	Dark grey sandy CLAY		21	Sample was quartered, oven dried at 107.2 °C			
2512777	TP011.504	4	1.50	Not Given	D	Dark grey slightly gravelly slightly sandy CLAY		32	Sample was quartered, oven dried at 107.2 °C			
2512780	TP021.505	5	1.50	Not Given	D	Brown very sandy slightly silty CLAY		25	Sample was quartered, oven dried at 107.2 °C			
2512782	TP030.301	1	0.30	Not Given	D	Dark brown gravelly CLAY		19	Sample was quartered, oven dried at 107.2 °C			
2512783	TP031.305	5	1.30	Not Given	D	Brown sandy CLAY		16	Sample was quartered, oven dried at 107.2 °C			
2512784	TP031.807	7	1.80	Not Given	D	Brownish grey CLAY		15	Sample was quartered, oven dried at 107.2 °C			
2512787	TP041.003	3	1.00	Not Given	D	Light brown slightly gravelly slightly sandy CLAY		16	Sample was quartered, oven dried at 107.2 °C			
2512788	TP050.501	1	0.50	Not Given	D	Cream colour clayey SAND		22	Sample was quartered, oven dried at 106 °C			
2512789	TP051.503	3	1.50	Not Given	D	Brownish grey slightly sandy CLAY		24	Sample was quartered, oven dried at 107.2 °C			
2512790	TP061.001	1	1.00	Not Given	D	Dark brown SHALES		11	Sample was quartered, oven dried at 107.2 °C			

Comments:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 099.16

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

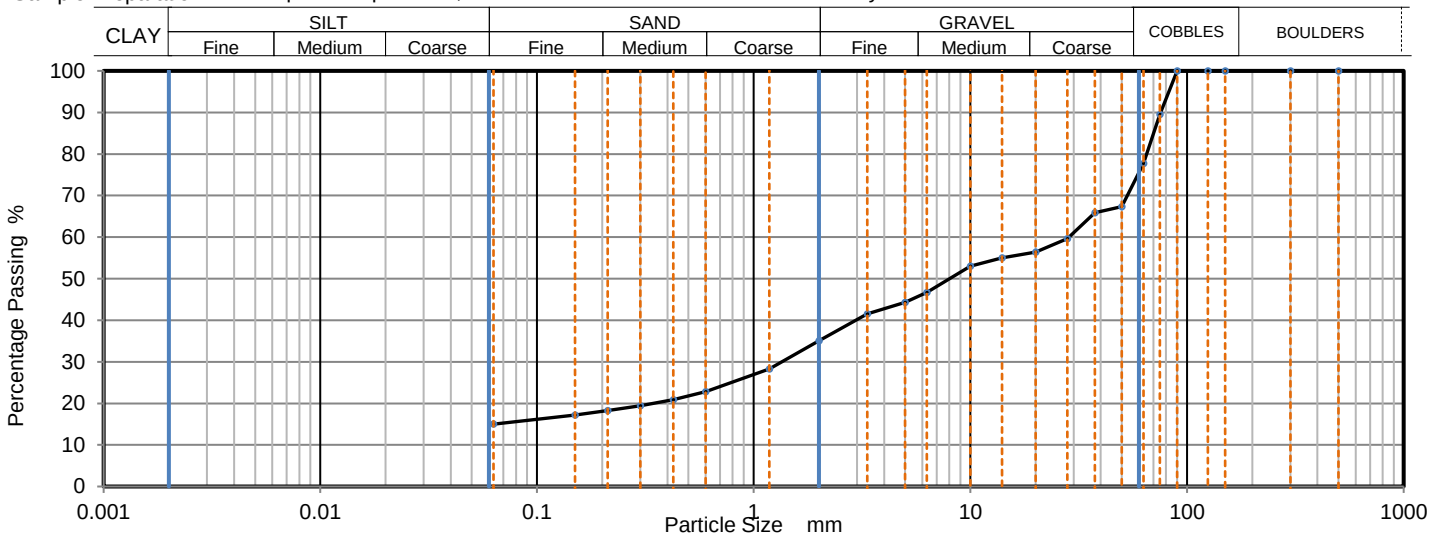
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512776	Depth Top [m]:	0.50
Hole No.:	TP010.502	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Grey sandy clayey GRAVEL with cobbles		
Sample Preparation:	Sample was quartered, oven dried at 106.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	90		
63	78		
50	67		
37.5	66		
28	60		
20	56		
14	55		
10	53		
6.3	47		
5	44		
3.35	42		
2	35		
1.18	28		
0.6	23		
0.425	21		
0.3	19		
0.212	18		
0.15	17		
0.063	15		

Sample Proportions	% dry mass
Very coarse	22
Gravel	43
Sand	20
Fines <0.063mm	15

Grading Analysis		
D100	mm	90
D60	mm	28.5
D30	mm	1.35
D10	mm	
Uniformity Coefficient		> 450
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

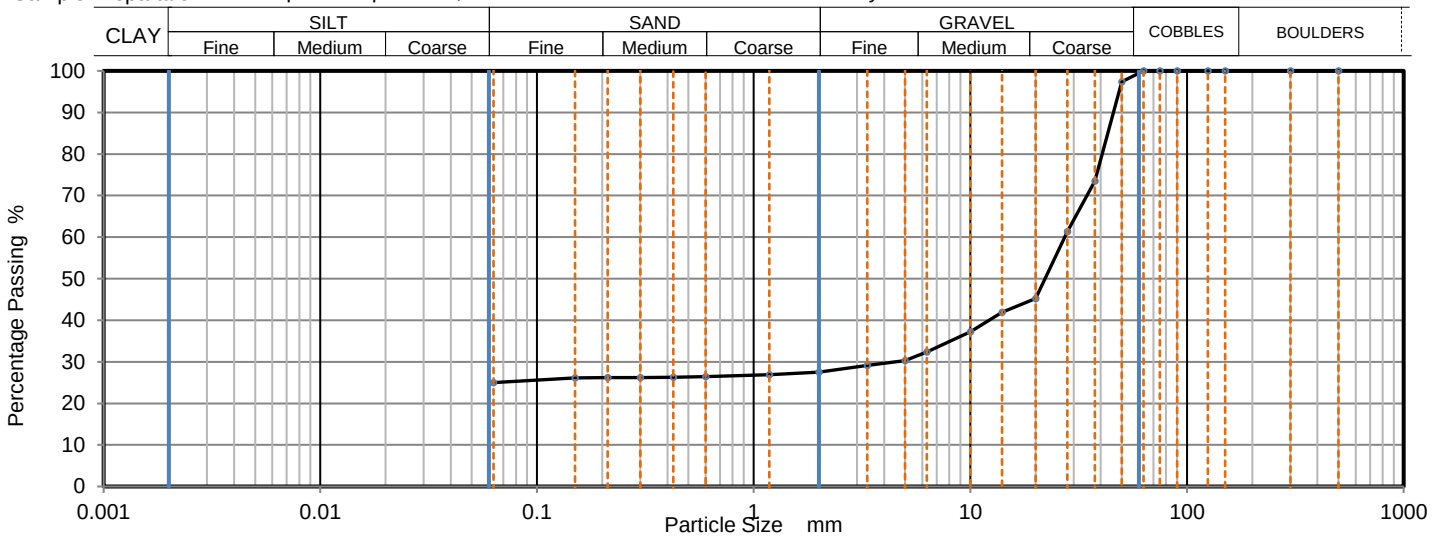
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512779	Depth Top [m]:	0.90
Hole No.:	TP020.904	Depth Base [m]:	Not Given
Sample Reference:	4	Sample Type:	B
Sample Description:	Brownish grey MUDSTONE		
Sample Preparation:	Sample was quartered, oven dried at 108.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	74		
28	61		
20	45		
14	42		
10	37		
6.3	32		
5	30		
3.35	29		
2	28		
1.18	27		
0.6	26		
0.425	26		
0.3	26		
0.212	26		
0.15	26		
0.063	26		

Sample Proportions	% dry mass
Very coarse	0
Gravel	72
Sand	2
Fines <0.063mm	26

Grading Analysis		
D100	mm	63
D60	mm	27.3
D30	mm	4.49
D10	mm	
Uniformity Coefficient		> 430
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed: Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

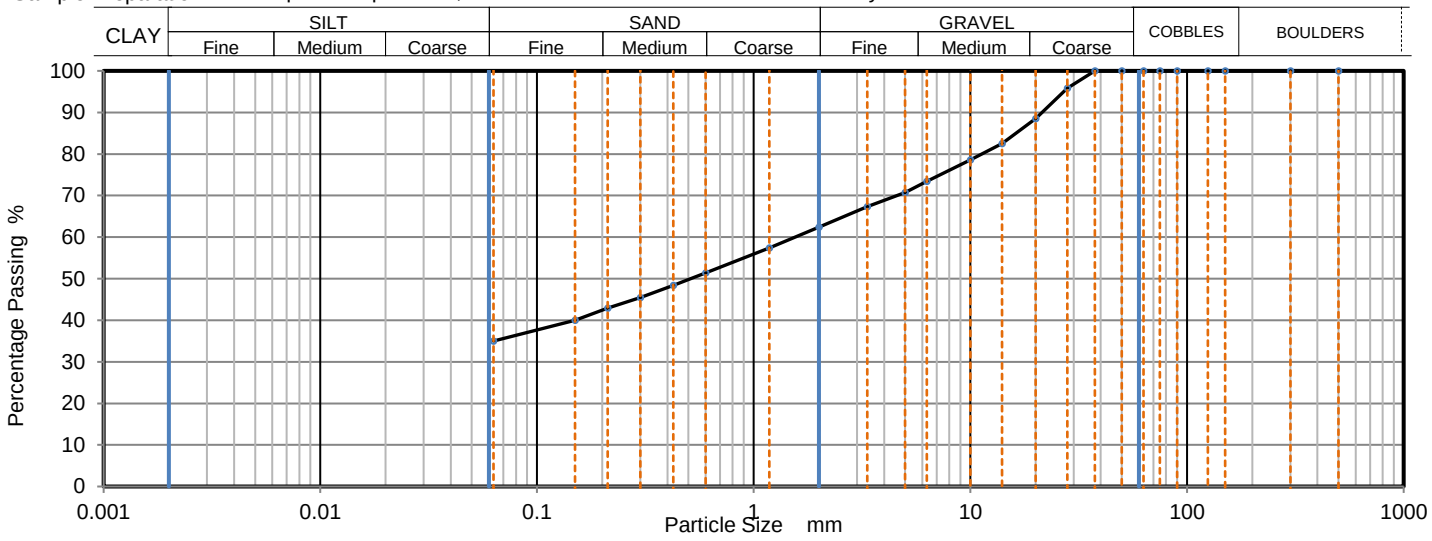
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512781	Depth Top [m]:	0.30
Hole No.:	TP030.302	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Dark grey very sandy very clayey GRAVEL with fragments of roots		
Sample Preparation:	Sample was quartered, oven dried at 107.2 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	89		
14	83		
10	79		
6.3	73		
5	71		
3.35	67		
2	62		
1.18	57		
0.6	51		
0.425	48		
0.3	46		
0.212	43		
0.15	40		
0.063	35		

Sample Proportions	% dry mass
Very coarse	0
Gravel	38
Sand	27
Fines <0.063mm	35

Grading Analysis		
D100	mm	37.5
D60	mm	1.56
D30	mm	
D10	mm	
Uniformity Coefficient		> 25
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed: Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

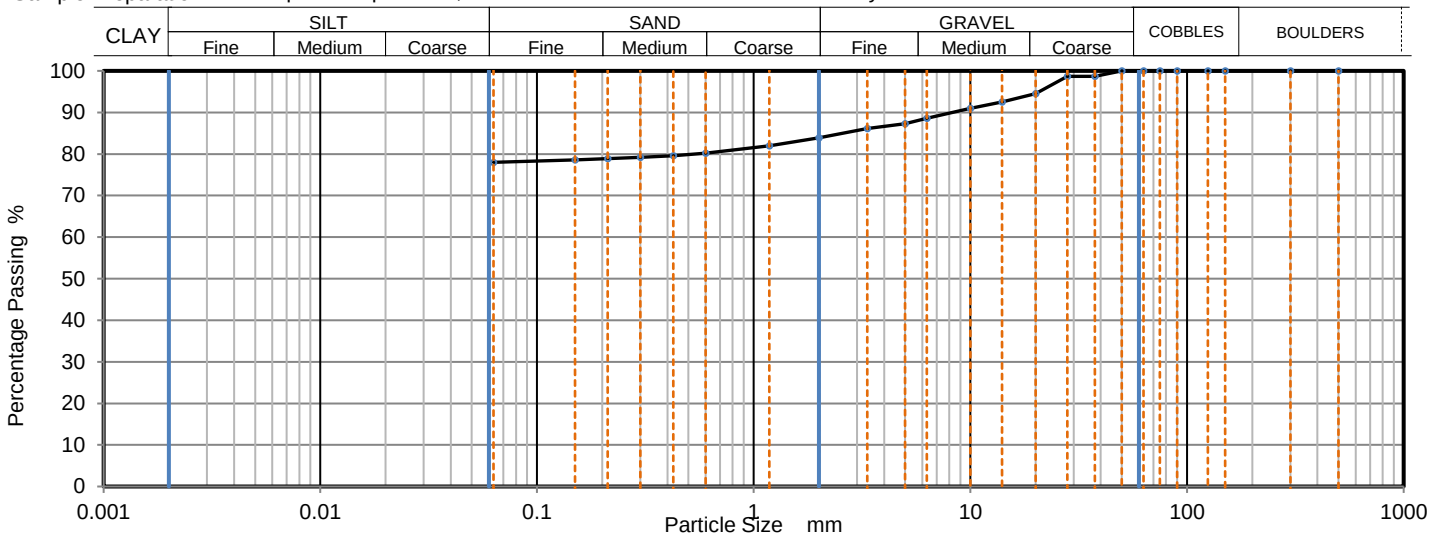
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512786	Depth Top [m]:	1.00
Hole No.:	TP041.004	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Greyish brown slightly sandy gravelly CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.2 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	99		
28	99		
20	95		
14	93		
10	91		
6.3	89		
5	87		
3.35	86		
2	84		
1.18	82		
0.6	80		
0.425	80		
0.3	79		
0.212	79		
0.15	79		
0.063	78		

Sample Proportions	% dry mass
Very coarse	0
Gravel	16
Sand	6
Fines <0.063mm	78

Grading Analysis		
D100	mm	50
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed: Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

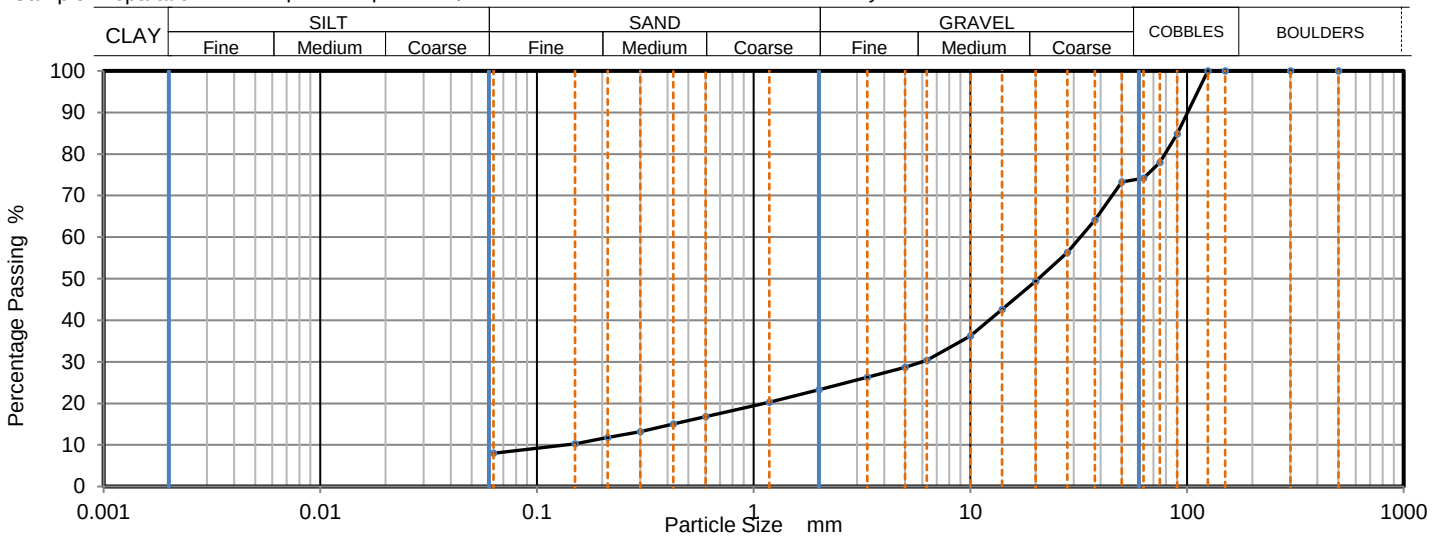
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512791	Depth Top [m]:	0.50
Hole No.:	TP050.502	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Dark grey sandy clayey GRAVEL with fragments of crushed concrete, cobbles		
Sample Preparation:	Sample was quartered, oven dried at 108.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	85		
75	78		
63	74		
50	73		
37.5	64		
28	56		
20	49		
14	43		
10	36		
6.3	30		
5	29		
3.35	26		
2	23		
1.18	20		
0.6	17		
0.425	15		
0.3	13		
0.212	12		
0.15	10		
0.063	8		

Sample Proportions	% dry mass
Very coarse	26
Gravel	51
Sand	15
Fines <0.063mm	8

Grading Analysis		
D100	mm	125
D60	mm	32.2
D30	mm	5.99
D10	mm	0.134
Uniformity Coefficient		240
Curvature Coefficient		8.3

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

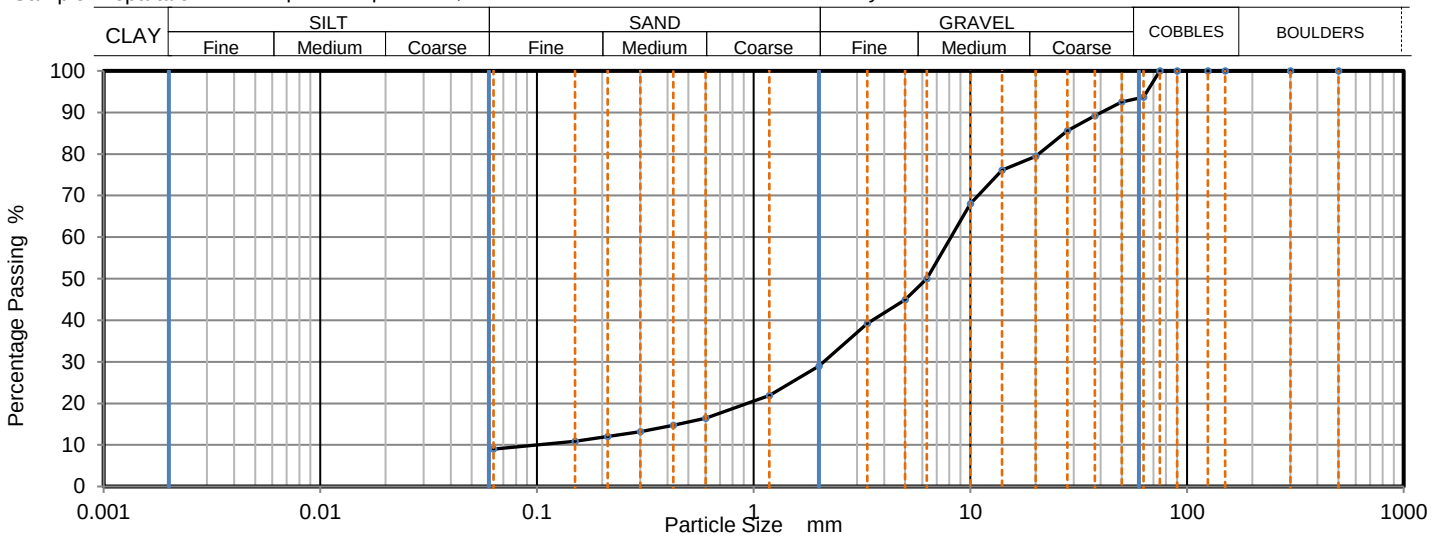
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	07/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512792	Depth Top [m]:	1.00
Hole No.:	TP061.002	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Dark grey sandy clayey SHALES		
Sample Preparation:	Sample was quartered, oven dried at 106.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	94		
50	93		
37.5	89		
28	86		
20	79		
14	76		
10	68		
6.3	50		
5	45		
3.35	39		
2	29		
1.18	22		
0.6	16		
0.425	15		
0.3	13		
0.212	12		
0.15	11		
0.063	9		

Sample Proportions	% dry mass
Very coarse	6
Gravel	65
Sand	20
Fines <0.063mm	9

Grading Analysis		
D100	mm	75
D60	mm	8.14
D30	mm	2.11
D10	mm	0.0976
Uniformity Coefficient		83
Curvature Coefficient		5.6

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 100.21

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

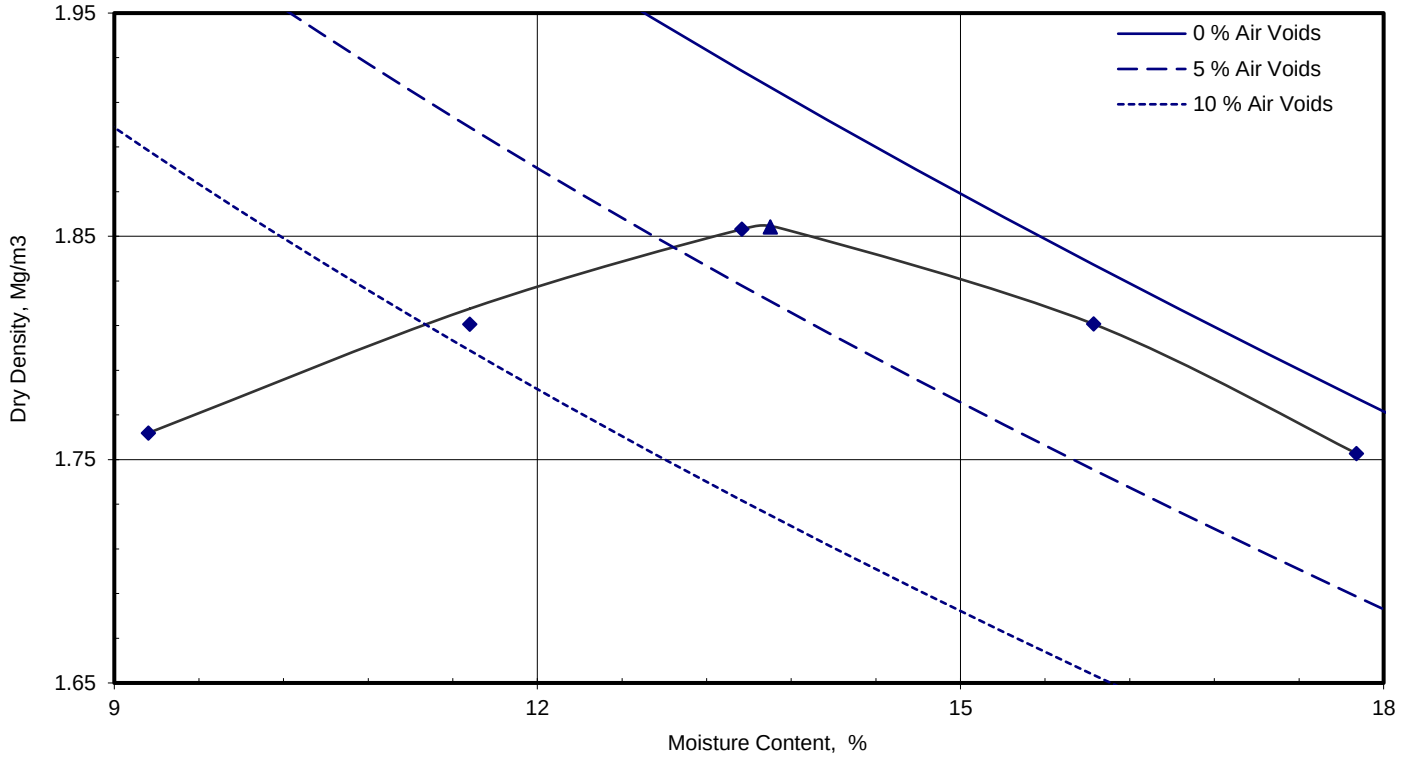
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	15/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512778	Depth Top [m]:	1.50
Hole No.:	TP011.505	Depth Base [m]:	Not Given
Sample Reference:	5	Sample Type:	B
Sample Description:	Dark grey slightly gravelly CLAY		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Moisture Content	%	9.2	12	13	16	18
Dry Density	Mg/m³	1.76	1.81	1.85	1.81	1.75

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	5
Particle Density - Assumed	Mg/m³	2.60
As received Moisture Content	%	13
Maximum Dry Density	Mg/m³	**1.85**

Optimum Moisture Content	%	**14**

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 109.22

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

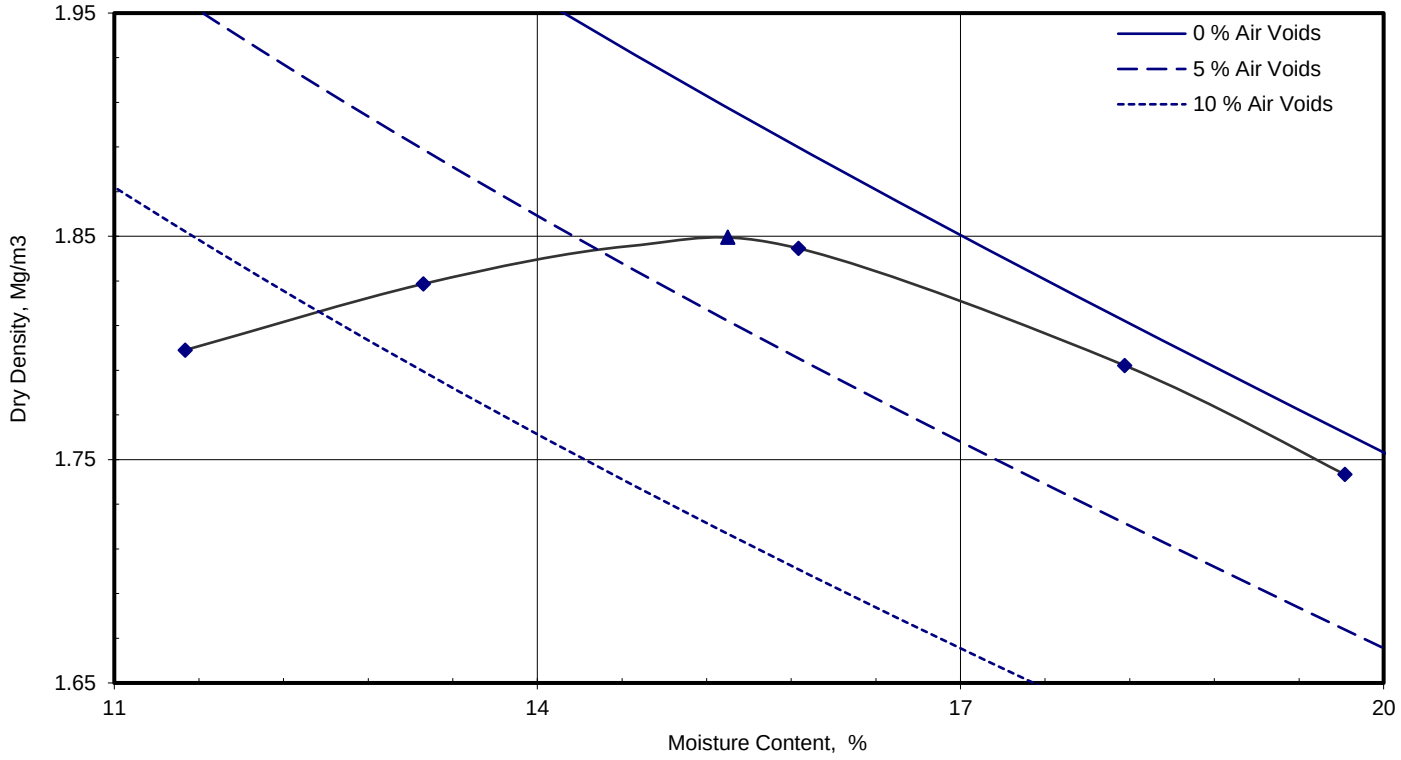
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Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	15/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512785	Depth Top [m]:	1.80
Hole No.:	TP031.808	Depth Base [m]:	Not Given
Sample Reference:	8	Sample Type:	B
Sample Description:	Brownish grey slightly gravelly CLAY		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Moisture Content	%	12	13	16	18	20
Dry Density	Mg/m³	1.80	1.83	1.84	1.79	1.74

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	3
Particle Density - Assumed	Mg/m³	2.70
As received Moisture Content	%	16
Maximum Dry Density	Mg/m³	**1.85**

Optimum Moisture Content	%	**15**

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 109.22

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/MOISTURE CONTENT RELATIONSHIP METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-4: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

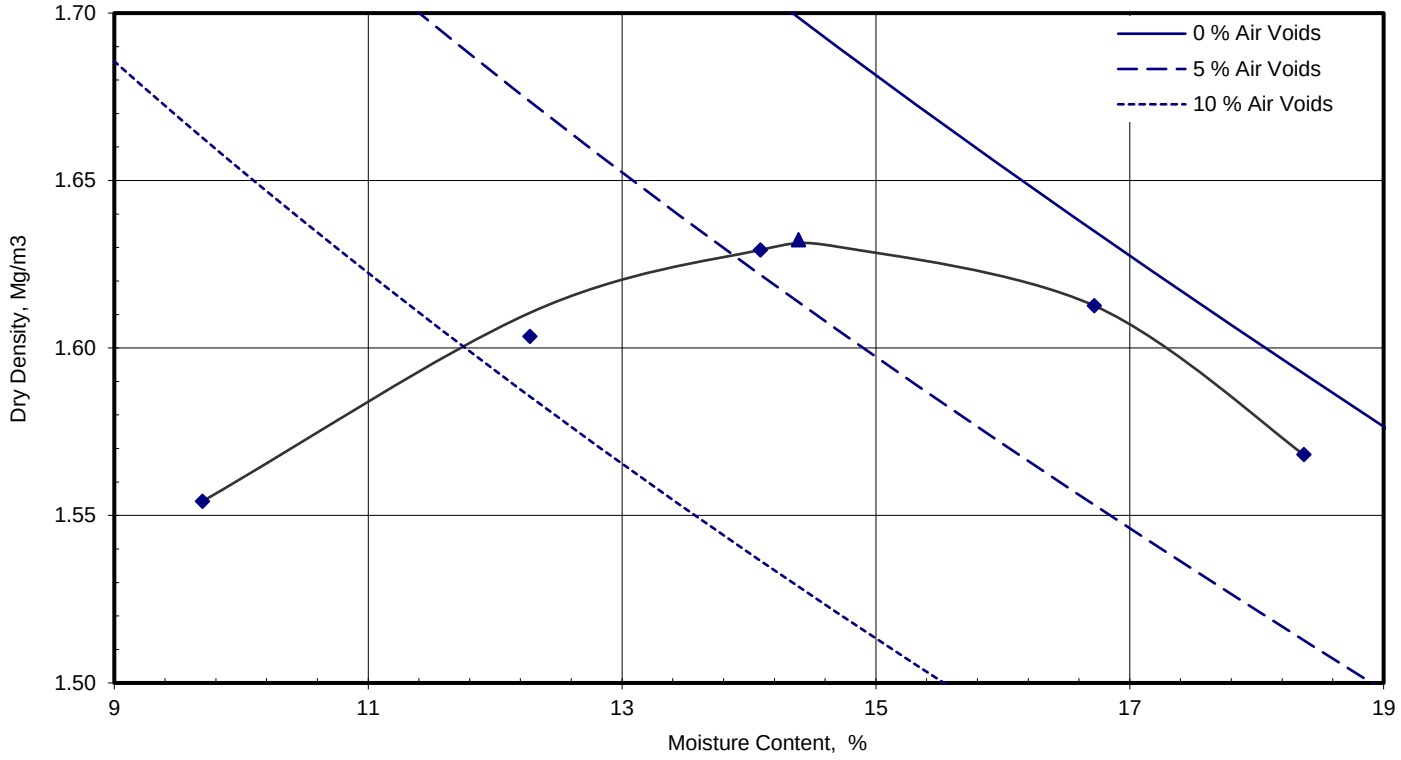
4041

Client:	Soiltechnics Limited	Client Reference:	STU5725
Client Address:	Cedar Barn, White Lodge, Walgrave, Northampton, NN6 9PY	Job Number:	22-99038
		Date Sampled:	18/11/2022
		Date Received:	23/11/2022
Contact:	Admin	Date Tested:	15/12/2022
Site Address:	East Bierley Sports Community Association	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2512793	Depth Top [m]:	0.50
Hole No.:	Combine Sample	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Dark grey slightly gravelly CLAY		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Moisture Content	%	9.7	12	14	17	18
Dry Density	Mg/m³	1.55	1.60	1.63	1.61	1.57

Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	6
Particle Density - Assumed	Mg/m³	2.25
As received Moisture Content	%	9.7
Maximum Dry Density	Mg/m³	**1.63**

Optimum Moisture Content	%	**14**

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.4 using 2.5kg [light] Rammer

Remarks:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/12/2022

GF 109.22

soiltechnics
environmental ▪ geotechnical ▪ building fabric

Appendix F Chemical Laboratory Test Certificates

Alexa Band
Soiltechnics Ltd
White Lodge
Cedar Barn
Walgrave
NN6 9PY

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 22-09874

Site Reference:	East Bierley Sports Community Association
Project / Job Ref:	STU5725
Order No:	POR014114
Sample Receipt Date:	24/11/2022
Sample Scheduled Date:	28/11/2022
Report Issue Number:	1
Reporting Date:	02/12/2022

Authorised by:



Nick Watson
General Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Soil Analysis Certificate						
DETS Report No: 22-09874	**Date Sampled**	18/11/22	18/11/22	18/11/22	18/11/22	18/11/22
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: East Bierley Sports Community Association	**TP / BH No**	HP010.301	HP020.301	HP030.301	HP040.301	HP050.301
Project / Job Ref: STU5725	**Additional Refs**	HP01	HP02	HP03	HP04	HP05
Order No: POR014114	**Depth (m)**	0.30	0.30	0.30	0.30	0.30
Reporting Date: 02/12/2022	**DETS Sample No**	621779	621780	621781	621782	621783

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Soil Analysis Certificate						
DETS Report No: 22-09874	**Date Sampled**	18/11/22	18/11/22	18/11/22	18/11/22	18/11/22
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: East Bierley Sports Community Association	**TP / BH No**	HP060.301	HP070.301	HP080.301	HP090.301	HP100.301
Project / Job Ref: STU5725	**Additional Refs**	HP06	HP07	HP08	HP09	HP010
Order No: POR014114	**Depth (m)**	0.30	0.30	0.30	0.30	0.30
Reporting Date: 02/12/2022	**DETS Sample No**	621784	621785	621786	621787	621788

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

UKAS TESTING
4480

Soil Analysis Certificate						
DETS Report No: 22-09874	**Date Sampled**	18/11/22	18/11/22			
Soiltechnics Ltd	**Time Sampled**	None Supplied	None Supplied			
Site Reference: East Bierley Sports Community Association	**TP / BH No**	HP110.301	HP120.301			
Project / Job Ref: STU5725	**Additional Refs**	HP011	HP012			
Order No: POR014114	**Depth (m)**	0.30	0.30			
Reporting Date: 02/12/2022	**DETS Sample No**	621789	621790			

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 22-09874
Soiltechnics Ltd
Site Reference: East Bierley Sports Community Association
Project / Job Ref: STU5725
Order No: POR014114
Reporting Date: 02/12/2022

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

List of HWOL Acronyms and Operators
DETS Report No: 22-09874
Soiltechnics Ltd
Site Reference: East Bierley Sports Community Association
Project / Job Ref: STU5725
Order No: POR014114
Reporting Date: 02/12/2022

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

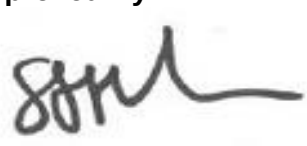
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-35079-1
Initial Date of Issue:	22-Sep-2022
Client	Soiltechnics Limited
Client Address:	Cedar Barn White Lodge Walgrave Northampton Northamptonshire NN6 9PY
Contact(s):	Alexa Band Lauren Wenham
Project	STU5725-20220912-1538-CHE-A Community Centre

Quotation No.:	Q22-28831	**Date Received:**	14-Sep-2022
Order No.:		**Date Instructed:**	14-Sep-2022
No. of Samples:	14		
Turnaround (Wkdays):	5	**Results Due:**	21-Sep-2022
Date Approved:	22-Sep-2022		

Approved By:



Details:	Stuart Henderson, Technical Manager

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited		**Chemtest Job No.:**			22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831		**Chemtest Sample ID.:**			1505837	1505838	1505839	1505840	1505841	1505842	1505843	1505844	1505845
Order No.:		Client Sample Ref.:			1	1	1	1	2	1	2	1	2
		Client Sample ID.:			TS010.101	WAC010.301	WAC020.201	WS010.101	WS011.002	WS020.101	WS021.802	WS030.101	WS030.202
		Sample Location:			TS01	WAC01	WAC02	WS01	WS01	WS02	WS02	WS03	WS03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	0.30	0.20	0.10	1.00	0.10	1.80	0.10	0.20
		Bottom Depth (m):				1.40	1.80						
		Date Sampled:			08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	Fibres/Clumps	-	-						
Asbestos Identification	U	2192		N/A	Crocidolite	No Asbestos Detected	No Asbestos Detected						
Moisture	N	2030	%	0.020	7.6	10	13	8.4	8.8	10	20	1.6	14
pH	U	2010		4.0	6.9	8.1	8.1						
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.58	0.62	0.61						
Cyanide (Complex)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Arsenic	U	2455	mg/kg	0.5	15	22	19						
Beryllium	U	2455	mg/kg	0.5	0.9	1.0	1.2						
Cadmium	U	2455	mg/kg	0.10	0.78	0.23	0.13						
Chromium	U	2455	mg/kg	0.5	150	22	19						
Copper	U	2455	mg/kg	0.50	59	45	77						
Mercury	U	2455	mg/kg	0.05	0.29	0.07	< 0.05						
Nickel	U	2455	mg/kg	0.50	21	27	35						
Lead	U	2455	mg/kg	0.50	68	49	62						
Selenium	U	2455	mg/kg	0.25	0.79	0.84	0.76						
Vanadium	U	2455	mg/kg	0.5	20	20	39						
Zinc	U	2455	mg/kg	0.50	170	130	60						
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
LOI	U	2610	%	0.10	17	11	2.6						
Organic Matter	U	2625	%	0.40	23	14	32	25		8.2		47	
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0						
TPH >C10-C21	N	2670	mg/kg	1.0	38	< 1.0	110						
TPH >C21-C40	N	2670	mg/kg	1.0	12	< 1.0	150						
Total TPH >C6-C40	U	2670	mg/kg	10	50	< 10	260						
Naphthalene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10				< 0.10	1.2	< 0.10	2.7	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10				< 0.10	0.26	< 0.10	1.9	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10				1.1	2.8	0.88	9.6	0.46	< 0.10
Pyrene	U	2700	mg/kg	0.10				1.4	2.9	0.21	11	0.54	< 0.10

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited		**Chemtest Job No.:**			22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831		**Chemtest Sample ID.:**			1505837	1505838	1505839	1505840	1505841	1505842	1505843	1505844	1505845
Order No.:		Client Sample Ref.:			1	1	1	1	2	1	2	1	2
		Client Sample ID.:			TS010.101	WAC010.301	WAC020.201	WS010.101	WS011.002	WS020.101	WS021.802	WS030.101	WS030.202
		Sample Location:			TS01	WAC01	WAC02	WS01	WS01	WS02	WS02	WS03	WS03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	0.30	0.20	0.10	1.00	0.10	1.80	0.10	0.20
		Bottom Depth (m):				1.40	1.80						
		Date Sampled:			08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Benzo[a]anthracene	U	2700	mg/kg	0.10				3.4	1.2	< 0.10	6.3	1.1	< 0.10
Chrysene	U	2700	mg/kg	0.10				3.0	1.5	< 0.10	7.0	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10				< 0.10	4.3	< 0.10	3.6	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10				< 0.10	3.8	< 0.10	0.65	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10				< 0.10	2.3	< 0.10	3.5	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0				8.9	20	< 2.0	46	2.1	< 2.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Phenanthrene	U	2800	mg/kg	0.10	0.94	5.0	1.7						
Anthracene	U	2800	mg/kg	0.10	0.15	1.1	0.39						
Fluoranthene	U	2800	mg/kg	0.10	1.0	5.2	2.5						
Pyrene	U	2800	mg/kg	0.10	1.1	4.3	2.6						
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.53	2.0	1.2						
Chrysene	U	2800	mg/kg	0.10	0.54	1.7	1.4						
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	2.4	1.4						
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.80	0.34						
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	1.9	1.1						
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.3	24	13						
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10						

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited			**Chemtest Job No.:**		22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831			**Chemtest Sample ID.:**		1505846	1505847	1505848	1505849	1505850
Order No.:			Client Sample Ref.:		3	1	1	1	2
			Client Sample ID.:		WS030.703	WS040.101	WS050.301	WS060.101	WS061.402
			Sample Location:		WS03	WS04	WS05	WS06	WS06
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.70	0.10	0.30	0.10	1.40
			Bottom Depth (m):						
			Date Sampled:		08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
			Asbestos Lab:						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A					
Asbestos Identification	U	2192		N/A					
Moisture	N	2030	%	0.020	7.9	7.8	11	9.5	8.9
pH	U	2010		4.0					
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40					
Cyanide (Complex)	U	2300	mg/kg	0.50					
Cyanide (Free)	U	2300	mg/kg	0.50					
Cyanide (Total)	U	2300	mg/kg	0.50					
Arsenic	U	2455	mg/kg	0.5					
Beryllium	U	2455	mg/kg	0.5					
Cadmium	U	2455	mg/kg	0.10					
Chromium	U	2455	mg/kg	0.5					
Copper	U	2455	mg/kg	0.50					
Mercury	U	2455	mg/kg	0.05					
Nickel	U	2455	mg/kg	0.50					
Lead	U	2455	mg/kg	0.50					
Selenium	U	2455	mg/kg	0.25					
Vanadium	U	2455	mg/kg	0.5					
Zinc	U	2455	mg/kg	0.50					
Chromium (Hexavalent)	N	2490	mg/kg	0.50					
LOI	U	2610	%	0.10					
Organic Matter	U	2625	%	0.40				1.8	
TPH >C6-C10	N	2670	mg/kg	1.0					
TPH >C10-C21	N	2670	mg/kg	1.0					
TPH >C21-C40	N	2670	mg/kg	1.0					
Total TPH >C6-C40	U	2670	mg/kg	10					
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.0
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.41
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.1
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.7
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	3.7	< 0.10	15
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.8	< 0.10	4.6
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	2.7	8.4	0.41	19
Pyrene	U	2700	mg/kg	0.10	< 0.10	3.4	8.1	0.79	18

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited			**Chemtest Job No.:**		22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831			**Chemtest Sample ID.:**		1505846	1505847	1505848	1505849	1505850
Order No.:			Client Sample Ref.:		3	1	1	1	2
			Client Sample ID.:		WS030.703	WS040.101	WS050.301	WS060.101	WS061.402
			Sample Location:		WS03	WS04	WS05	WS06	WS06
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.70	0.10	0.30	0.10	1.40
			Bottom Depth (m):						
			Date Sampled:		08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
			Asbestos Lab:						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	0.81	3.4	< 0.10	6.8
Chrysene	U	2700	mg/kg	0.10	< 0.10	0.87	3.1	< 0.10	8.2
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	3.7	< 0.10	7.2
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.7	< 0.10	2.9
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	2.7	< 0.10	6.1
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.0
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.81
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.9
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	7.8	37	< 2.0	100
Naphthalene	U	2800	mg/kg	0.10					
Acenaphthylene	N	2800	mg/kg	0.10					
Acenaphthene	U	2800	mg/kg	0.10					
Fluorene	U	2800	mg/kg	0.10					
Phenanthrene	U	2800	mg/kg	0.10					
Anthracene	U	2800	mg/kg	0.10					
Fluoranthene	U	2800	mg/kg	0.10					
Pyrene	U	2800	mg/kg	0.10					
Benzo[a]anthracene	U	2800	mg/kg	0.10					
Chrysene	U	2800	mg/kg	0.10					
Benzo[b]fluoranthene	U	2800	mg/kg	0.10					
Benzo[k]fluoranthene	U	2800	mg/kg	0.10					
Benzo[a]pyrene	U	2800	mg/kg	0.10					
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10					
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10					
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10					
Total Of 16 PAH's	N	2800	mg/kg	2.0					
Total Phenols	U	2920	mg/kg	0.10					

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Amended Report

Report No.:	22-35079-2		
Initial Date of Issue:	22-Sep-2022	**Date of Re-Issue:**	29-Sep-2022
Client	Soiltechnics Limited		
Client Address:	Cedar Barn White Lodge Walgrave Northampton Northamptonshire NN6 9PY		
Contact(s):	Alexa Band Lauren Wenham		
Project	STU5725-20220912-1538-CHE-A Community Centre		
Quotation No.:	Q22-28831	**Date Received:**	14-Sep-2022
Order No.:		**Date Instructed:**	14-Sep-2022
No. of Samples:	14		
Turnaround (Wkdays):	11	**Results Due:**	29-Sep-2022
Date Approved:	29-Sep-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited		**Chemtest Job No.:**			22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831		**Chemtest Sample ID.:**			1505837	1505838	1505839	1505840	1505841	1505842	1505843	1505844	1505845
Order No.:		Client Sample Ref.:			1	1	1	1	2	1	2	1	2
		Client Sample ID.:			TS010.101	WAC010.301	WAC020.201	WS010.101	WS011.002	WS020.101	WS021.802	WS030.101	WS030.202
		Sample Location:			TS01	WAC01	WAC02	WS01	WS01	WS02	WS02	WS03	WS03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	0.30	0.20	0.10	1.00	0.10	1.80	0.10	0.20
		Bottom Depth (m):				1.40	1.80						
		Date Sampled:			08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	Fibres/Clumps	-	-						
Asbestos Identification	U	2192		N/A	Crocidolite	No Asbestos Detected	No Asbestos Detected						
Asbestos by Gravimetry	U	2192	%	0.001	<0.001								
Total Asbestos	U	2192	%	0.001	<0.001								
Moisture	N	2030	%	0.020	7.6	10	13	8.4	8.8	10	20	1.6	14
pH	U	2010		4.0	6.9	8.1	8.1						
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.58	0.62	0.61						
Cyanide (Complex)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
Arsenic	U	2455	mg/kg	0.5	15	22	19						
Beryllium	U	2455	mg/kg	0.5	0.9	1.0	1.2						
Cadmium	U	2455	mg/kg	0.10	0.78	0.23	0.13						
Chromium	U	2455	mg/kg	0.5	150	22	19						
Copper	U	2455	mg/kg	0.50	59	45	77						
Mercury	U	2455	mg/kg	0.05	0.29	0.07	< 0.05						
Nickel	U	2455	mg/kg	0.50	21	27	35						
Lead	U	2455	mg/kg	0.50	68	49	62						
Selenium	U	2455	mg/kg	0.25	0.79	0.84	0.76						
Vanadium	U	2455	mg/kg	0.5	20	20	39						
Zinc	U	2455	mg/kg	0.50	170	130	60						
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50						
LOI	U	2610	%	0.10	17	11	2.6						
Organic Matter	U	2625	%	0.40	23	14	32	25		8.2		47	
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0						
TPH >C10-C21	N	2670	mg/kg	1.0	38	< 1.0	110						
TPH >C21-C40	N	2670	mg/kg	1.0	12	< 1.0	150						
Total TPH >C6-C40	U	2670	mg/kg	10	50	< 10	260						
Naphthalene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10				< 0.10	1.2	< 0.10	2.7	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10				< 0.10	0.26	< 0.10	1.9	< 0.10	< 0.10

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited		**Chemtest Job No.:**			22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831		**Chemtest Sample ID.:**			1505837	1505838	1505839	1505840	1505841	1505842	1505843	1505844	1505845
Order No.:		Client Sample Ref.:			1	1	1	1	2	1	2	1	2
		Client Sample ID.:			TS010.101	WAC010.301	WAC020.201	WS010.101	WS011.002	WS020.101	WS021.802	WS030.101	WS030.202
		Sample Location:			TS01	WAC01	WAC02	WS01	WS01	WS02	WS02	WS03	WS03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	0.30	0.20	0.10	1.00	0.10	1.80	0.10	0.20
		Bottom Depth (m):				1.40	1.80						
		Date Sampled:			08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
		Asbestos Lab:			COVENTRY	COVENTRY	COVENTRY						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Fluoranthene	U	2700	mg/kg	0.10				1.1	2.8	0.88	9.6	0.46	< 0.10
Pyrene	U	2700	mg/kg	0.10				1.4	2.9	0.21	11	0.54	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10				3.4	1.2	< 0.10	6.3	1.1	< 0.10
Chrysene	U	2700	mg/kg	0.10				3.0	1.5	< 0.10	7.0	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10				< 0.10	4.3	< 0.10	3.6	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10				< 0.10	3.8	< 0.10	0.65	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10				< 0.10	2.3	< 0.10	3.5	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0				8.9	20	< 2.0	46	2.1	< 2.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Phenanthrene	U	2800	mg/kg	0.10	0.94	5.0	1.7						
Anthracene	U	2800	mg/kg	0.10	0.15	1.1	0.39						
Fluoranthene	U	2800	mg/kg	0.10	1.0	5.2	2.5						
Pyrene	U	2800	mg/kg	0.10	1.1	4.3	2.6						
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.53	2.0	1.2						
Chrysene	U	2800	mg/kg	0.10	0.54	1.7	1.4						
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	2.4	1.4						
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.80	0.34						
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	1.9	1.1						
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10						
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.3	24	13						
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10						

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited		**Chemtest Job No.:**			22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831		**Chemtest Sample ID.:**			1505846	1505847	1505848	1505849	1505850
Order No.:		Client Sample Ref.:			3	1	1	1	2
		Client Sample ID.:			WS030.703	WS040.101	WS050.301	WS060.101	WS061.402
		Sample Location:			WS03	WS04	WS05	WS06	WS06
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.70	0.10	0.30	0.10	1.40
		Bottom Depth (m):							
		Date Sampled:			08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
		Asbestos Lab:							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A					
Asbestos Identification	U	2192		N/A					
Asbestos by Gravimetry	U	2192	%	0.001					
Total Asbestos	U	2192	%	0.001					
Moisture	N	2030	%	0.020	7.9	7.8	11	9.5	8.9
pH	U	2010		4.0					
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40					
Cyanide (Complex)	U	2300	mg/kg	0.50					
Cyanide (Free)	U	2300	mg/kg	0.50					
Cyanide (Total)	U	2300	mg/kg	0.50					
Arsenic	U	2455	mg/kg	0.5					
Beryllium	U	2455	mg/kg	0.5					
Cadmium	U	2455	mg/kg	0.10					
Chromium	U	2455	mg/kg	0.5					
Copper	U	2455	mg/kg	0.50					
Mercury	U	2455	mg/kg	0.05					
Nickel	U	2455	mg/kg	0.50					
Lead	U	2455	mg/kg	0.50					
Selenium	U	2455	mg/kg	0.25					
Vanadium	U	2455	mg/kg	0.5					
Zinc	U	2455	mg/kg	0.50					
Chromium (Hexavalent)	N	2490	mg/kg	0.50					
LOI	U	2610	%	0.10					
Organic Matter	U	2625	%	0.40				1.8	
TPH >C6-C10	N	2670	mg/kg	1.0					
TPH >C10-C21	N	2670	mg/kg	1.0					
TPH >C21-C40	N	2670	mg/kg	1.0					
Total TPH >C6-C40	U	2670	mg/kg	10					
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.0
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.41
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.1
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.7
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	3.7	< 0.10	15
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.8	< 0.10	4.6

Results - Soil

Project: STU5725-20220912-1538-CHE-A Community Centre

Client: Soiltechnics Limited				**Chemtest Job No.:**	22-35079	22-35079	22-35079	22-35079	22-35079
Quotation No.: Q22-28831				**Chemtest Sample ID.:**	1505846	1505847	1505848	1505849	1505850
Order No.:				Client Sample Ref.:	3	1	1	1	2
				Client Sample ID.:	WS030.703	WS040.101	WS050.301	WS060.101	WS061.402
				Sample Location:	WS03	WS04	WS05	WS06	WS06
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.70	0.10	0.30	0.10	1.40
				Bottom Depth (m):					
				Date Sampled:	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022	08-Sep-2022
				Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	2.7	8.4	0.41	19
Pyrene	U	2700	mg/kg	0.10	< 0.10	3.4	8.1	0.79	18
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	0.81	3.4	< 0.10	6.8
Chrysene	U	2700	mg/kg	0.10	< 0.10	0.87	3.1	< 0.10	8.2
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	3.7	< 0.10	7.2
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	1.7	< 0.10	2.9
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	2.7	< 0.10	6.1
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.0
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.81
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.9
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	7.8	37	< 2.0	100
Naphthalene	U	2800	mg/kg	0.10					
Acenaphthylene	N	2800	mg/kg	0.10					
Acenaphthene	U	2800	mg/kg	0.10					
Fluorene	U	2800	mg/kg	0.10					
Phenanthrene	U	2800	mg/kg	0.10					
Anthracene	U	2800	mg/kg	0.10					
Fluoranthene	U	2800	mg/kg	0.10					
Pyrene	U	2800	mg/kg	0.10					
Benzo[a]anthracene	U	2800	mg/kg	0.10					
Chrysene	U	2800	mg/kg	0.10					
Benzo[b]fluoranthene	U	2800	mg/kg	0.10					
Benzo[k]fluoranthene	U	2800	mg/kg	0.10					
Benzo[a]pyrene	U	2800	mg/kg	0.10					
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10					
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10					
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10					
Total Of 16 PAH's	N	2800	mg/kg	2.0					
Total Phenols	U	2920	mg/kg	0.10					

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

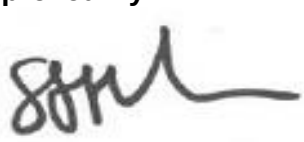
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-35082-1
Initial Date of Issue:	23-Sep-2022
Client	Soiltechnics Limited
Client Address:	Cedar Barn White Lodge Walgrave Northampton Northamptonshire NN6 9PY
Contact(s):	Alexa Band Lauren Wenham
Project	STU5725 East Brierly Sports Community Association

Quotation No.:		**Date Received:**	14-Sep-2022
Order No.:		**Date Instructed:**	14-Sep-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	23-Sep-2022
Date Approved:	23-Sep-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - 2 Stage WAC

Project: STU5725 East Brierly Sports Community Association

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-35082								
Chemtest Sample ID:	1505853								
Sample Ref:	1								
Sample ID:	WAC010.301						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	WAC01								
Top Depth(m):	0.3								
Bottom Depth(m):	1.4								
Sampling Date:	08-Sep-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			5.5	3	5	6
Loss On Ignition	2610	M	%			6.3	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			2200	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			12	100	--	--
pH	2010	M				8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.031	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0013	0.0010	0.0026	0.011	0.5	2	25
Barium	1455	U	0.034	0.020	0.067	0.21	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0013	0.0011	0.0027	0.0015	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.015	0.0077	0.030	0.085	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0019	0.0010	0.0038	0.011	0.06	0.7	5
Selenium	1455	U	0.0010	0.0007	0.0020	0.0072	0.1	0.5	7
Zinc	1455	U	< 0.003	0.003	< 0.003	0.029	4	50	200
Chloride	1220	U	1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.92	0.39	1.8	4.5	10	150	500
Sulphate	1220	U	21	11	42	120	1000	20000	50000
Total Dissolved Solids	1020	N	130	89	260	940	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.8	3.1	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	10

Leachate Test Information	
Leachant volume 1st extract/l	0.330
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.193

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: STU5725 East Brierly Sports Community Association

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-35082								
Chemtest Sample ID:	1505854								
Sample Ref:	1								
Sample ID:	WAC020.201						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample Location:	WAC02								
Top Depth(m):	0.2								
Bottom Depth(m):	1.8								
Sampling Date:	08-Sep-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			16	3	5	6
Loss On Ignition	2610	M	%			9.2	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			380	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			14	100	--	--
pH	2010	M				8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.022	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0013	0.0015	0.0026	0.015	0.5	2	25
Barium	1455	U	0.024	0.019	0.048	0.19	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0005	< 0.0005	0.0010	0.0006	0.5	10	70
Copper	1455	U	0.0027	0.0017	0.0053	0.0033	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.013	0.0085	0.026	0.091	0.5	10	30
Nickel	1455	U	0.0012	< 0.0005	0.0024	0.0015	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0021	0.0012	0.0042	0.013	0.06	0.7	5
Selenium	1455	U	0.0009	0.0005	0.0019	0.0060	0.1	0.5	7
Zinc	1455	U	0.003	< 0.003	0.007	0.004	4	50	200
Chloride	1220	U	1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	1.1	0.58	2.2	6.4	10	150	500
Sulphate	1220	U	26	11	52	130	1000	20000	50000
Total Dissolved Solids	1020	N	140	91	280	970	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	6.6	4.4	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.7

Leachate Test Information	
Leachant volume 1st extract/l	0.331
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.218

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix G Chemical Analysis Assessment

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GQRA Screening

Assessments	Status	Date	Created by	Reviewed By
Acute human health risk - Soils	*Not undertaken*			
Chronic human health risk - Soils	*Not undertaken*	*21/10/2022*	*JT*	*DH*
Chronic human health risk - Groundwater vapour	*Not undertaken*			
Controlled waters risk - Surface water	*Not undertaken*			
Controlled waters risk - Drinking water	*Not undertaken*			
Controlled waters - Free phase indicator	*Not undertaken*			
Phytotoxicity	*Not undertaken*			
Ecotoxicity	*Not undertaken*			

Key

Assessment	Abbr.	GQRA Source (in order of preference)	Last Update
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010

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Chronic human health risk (soils)

Scenario	
End user	Current and proposed site user
Receptor	POS (Park)
SOM	1.00%
GAC Preference	S4ULs over C4SLs

Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location	TS01	WAC01	WAC02	WS01	WS01	WS02	WS02	WS03	WS03	WS03	WS04	WS05	WS06	WS06
				Depth (m)	0.10	0.30 - 1.40	0.20 - 1.80	0.10	1.00	0.10	1.80	0.10	0.20	0.70	0.10	0.30	0.10	1.40
				Date	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22	08/09/22
Inorganics - Metals																		
Arsenic	S4UL	170	22		15	22	19											
Beryllium	S4UL	63	1.2		0.9	1	1.2											
Cadmium	S4UL	560	0.78		0.78	0.23	0.13											
Chromium (III)	S4UL	33000	150		150	22	19											
Chromium (VI)	S4UL	220	<LoD		< 0.50	< 0.50	< 0.50											
Copper	S4UL	44000	77		59	45	77											
Cyanide - Free	-	-	<LoD		< 0.50	< 0.50	< 0.50											
Lead	C4SL	1300	68		68	49	62											
Mercury	S4UL	240	0.29		0.29	0.07	< 0.05											
Nickel	S4UL	800	35		21	27	35											
Selenium	S4UL	1800	0.84		0.79	0.84	0.76											
Vanadium	S4UL	5000	39		20	20	39											
Zinc	S4UL	170000	170		170	130	60											
Inorganics - Asbestos																		
Asbestos Screen		N/A			Crocidolite	No Asbestos Detected	No Asbestos Detected											
Inorganics - Soil Parameters																		
Organic matter		N/A			23	14	32											
Organics - PAH & Phenol																		
Acenaphthene	S4UL	29000	2.1		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.1
Acenaphthylene	S4UL	29000	0.41		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.41
Anthracene	S4UL	150000	4.6		0.15	1.1	0.39	< 0.10	0.26	< 0.10	1.9	< 0.10	< 0.10	< 0.10	< 0.10	1.8	< 0.10	4.6
Benzo(a)anthracene	S4UL	49	6.8		0.53	2	1.2	3.4	1.2	< 0.10	6.3	1.1	< 0.10	< 0.10	0.81	3.4	< 0.10	6.8
Benzo(a)pyrene	S4UL	11	6.1		< 0.10	1.9	1.1	< 0.10	2.3	< 0.10	3.5	< 0.10	< 0.10	< 0.10	< 0.10	2.7	< 0.10	6.1
Benzo(b)fluoranthene	S4UL	13	7.2		< 0.10	2.4	1.4	< 0.10	4.3	< 0.10	3.6	< 0.10	< 0.10	< 0.10	< 0.10	3.7	< 0.10	7.2
Benzo(ghi)perylene	S4UL	1400	2.9		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.9
Benzo(k)fluoranthene	S4UL	370	3.8		< 0.10	0.8	0.34	< 0.10	3.8	< 0.10	0.65	< 0.10	< 0.10	< 0.10	< 0.10	1.7	< 0.10	2.9
Chrysene	S4UL	93	8.2		0.54	1.7	1.4	3	1.5	< 0.10	7	< 0.10	< 0.10	< 0.10	0.87	3.1	< 0.10	8.2
Dibenz(a,h)anthracen	S4UL	1.1	0.81		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.81
Fluoranthene	S4UL	6300	19		1	5.2	2.5	1.1	2.8	0.88	9.6	0.46	< 0.10	< 0.10	2.7	8.4	0.41	19
Fluorene	S4UL	20000	2.7		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.7
Indeno(1,2,3-cd)pyre	S4UL	150	3		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3
Naphthalene	S4UL	1200	3		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3
Phenanthrene	S4UL	6200	15		0.94	5	1.7	< 0.10	1.2	< 0.10	2.7	< 0.10	< 0.10	< 0.10	< 0.10	3.7	< 0.10	15
Phenol	S4UL	440	<LoD		< 0.10	< 0.10	< 0.10											
Pyrene	S4UL	15000	18		1.1	4.3	2.6	1.4	2.9	0.21	11	0.54	< 0.10	< 0.10	3.4	8.1	0.79	18

Appendix H Waste Classification and WAC Assessments

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Waste Classification Assessment Summary

Waste population	Cohesive and Granular Made Ground
Hazard assessment	Non-hazardous waste
List of waste code	17-05-04
List of waste description	Soil and stones other than those mentioned in 17-05-03

Hazard property	Assessment
HP1 - Explosive	Not hazardous by HP1
HP2 - Oxidising	Not hazardous by HP2
HP3 - Flammable	Not hazardous by HP3
HP4 - Irritant	Not hazardous by HP4
HP5 - STOT & aspiration toxicity	Not hazardous by HP5
HP6 - Acute toxicity	Not hazardous by HP6
HP7 - Carcinogenic	Not hazardous by HP7
HP8 - Corrosive	Not hazardous by HP8
HP9 - Infectious	Not hazardous by HP9
HP10 - Toxic for reproduction	Not hazardous by HP10
HP11 - Mutagenic	Not hazardous by HP11
HP12 - Release of an acute toxic gas	Not hazardous by HP12
HP13 - Sensitising	Not hazardous by HP13
HP14 - Ecotoxic	Not hazardous by HP14

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Waste classification

Overall assessment	
Waste population	Cohesive and Granular Made Ground
Hazard assessment	Non-hazardous waste
List of Waste code	17-05-04
List of waste description	Soil and stones other than those mentioned in 17-05-03
Is the statistical approach non-parametric method B utilised?	No
Moisture content correction factor	No correction made

Asbestos assessment		
Query	Value	Assessment
Are bulk ACMs visually identifiable?	No	Non-hazardous
Have free fibres been detected?	Yes	See below
What is the free fibre concentration (%)?	0.00%	Non-hazardous

Flammability assessment	
Comment	Assessment
The waste is not considered flammable as it is a solid waste without a free draining liquid phase, and the TPH concentration and composition is not consdiered to present a likely flammable hazard.	Non-hazardous

Hydrocarbon assessment	
Query	Assessment
Is the origin of the oil contamination known?	Unknown oil
B[a]P : TPH ratio (%)	Not required
B[a]P marker assessment	Not required

pH assessment		
Query	Value	Assessment
Are all substances present in the waste known?	No	See pH assessment below
pH - Min	6.90	Non-hazardous
pH - Max	8.40	Non-hazardous

Oxidising assessment	
Comment	Assessment
Cr (VI) is the only compound with an oxidising hazard statement (H271). On review, the concentration is considered too low to present a viable oxidising hazard in a waste soil	Non-hazardous

Ecotoxic assessment			
Equation	Sum	Criteria	Assessment
WM3. Eq. 2	0.00%	25%	Non-hazardous
WM3 Eq. 3	0.00%	25%	Non-hazardous
WM3 Eq. 4	0.00%	25%	Non-hazardous

Compound hazard assessments

| | | |

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Waste acceptance

Parameter	Inert waste landfill	Stable non-reactive hazardous waste in a non-hazardous landfill cell (SNRHW)	Hazardous waste landfill	Location	WAC01	WAC02
				Depth (m)	0.30 - 1.40	0.20 - 1.80
				Date	08/09/22	08/09/22
Parameters determined on the waste						
Total organic carbon	3	5	6		5.5	16
Loss on ignition			10		6.3	9.2
BTEX	6				< 0.010	< 0.010
PCBs (7 congeners)	1				< 0.10	< 0.10
Mineral oil	500				2200	380
PAH (17 congeners)	100				12	14
pH		6			8.1	8.1
Acid neutralisation capacity (pH 6)		To be evaluated	To be evaluated		0.031	0.022
Limit values (mg kg^{-1}) for compliance test using BN 12457-3 at L/S 10 l						
Arsenic	0.5	2	25		0.011	0.015
Barium	20	100	300		0.21	0.19
Cadmium	0.04	1	5		< 0.00011	< 0.00011
Chromium (III)	0.5	10	70		< 0.0005	0.0006
Copper	2	50	100		0.0015	0.0033
Mercury	0.01	0.2	2		< 0.00005	< 0.00005
Molybdenum	0.5	10	30		0.085	0.091
Nickel	0.4	10	40		< 0.0005	0.0015
Lead	0.5	10	50		< 0.0005	< 0.0005
Antimony	0.06	0.7	5		0.011	0.013
Selenium	0.1	0.5	7		0.0072	0.006
Zinc	4	50	200		0.029	0.004
Chloride	800	15,000	25,000		< 10	< 10
Fluoride	10	150	500		4.5	6.4
Sulphate	1,000	20,000	50,000		120	130
Total dissolved solids	4,000	60,000	100,000		940	970
Phenol	1				< 0.50	< 0.50
Dissolved organic carbon	500	800	1000		< 50	< 50
Classifications						
Waste classification					**Hazardous**	**Hazardous**
Landfill type					Hazardous	Exceeds hazardous - requires treatment

Key Notes:

1) The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride.

2) Soils with TOC values over the limit value may still be accepted provided the DOC value falls are below it's respective limit value.

3) In a hazardous waste, either the TOC or LOI must be used.